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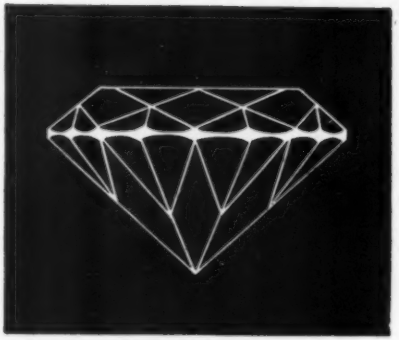

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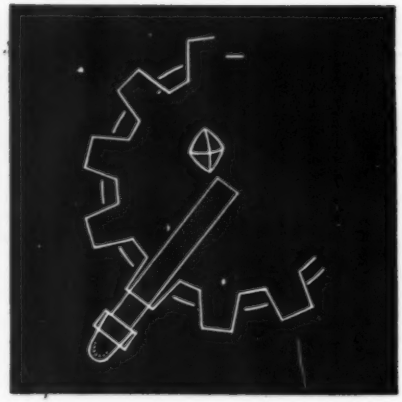

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Generally Speaking

Diamonds and Automation

The fear that increasing automation will do men out of jobs is dying, perhaps, but not yet dead. Where it still remains, diamonds may be looked upon as an enemy; for diamond tools, with their slow rate of wear and the reduced down time which they effect, are invaluable in automated factories.

An interesting case in which such fear is groundless has arisen recently with the production of an automatic mirror bevelling machine.[1] Bevels and pencil edges are ground by diamond wheels, and smoothed and felt-polished in a continuous sequence of operations. Labour is needed only to control the machine, to insert the mirror and to remove it in the finished state.

This operation takes but a fraction of the time, and therefore involves but a fraction of the labour, of bevelling and finishing with hand tools. But far from doing men out of work, the new machine compensates for a deficiency in labour, for the skilled craftsmen required no longer exist in sufficient numbers to keep up with the demands on production.

To what extent this situation reflects a general trend is a question of fine judgement. In this case, the development of machinery has adapted a particular industry to a labour problem, and the same must occur in many fields in which skilled craftsmen are disappearing. It seems on the face of it that in some other industries labour must adapt itself to developments in machinery, usually by becoming more skilled. But whichever takes the lead, the decline in suitable labour or the development in machines, adaptation of the one to the other must take place for it is a condition of progress. Progress is, of course, not inevitable, but to fail to attempt to progress is contrary to human nature.

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Application of Industrial Diamonds (V)

Clamping Tools for Dressing Diamonds

By H. J. Otterloo

In a preceding chapter we have already discussed some methods for the correct clamping and positioning of dressing diamonds for production work on cylindrical and centreless grinding machines. The use of dressing diamonds in tool-making work has grown so much, and they are being applied to so many multifarious purposes, that we must deal separately with the various tools used in this connection. The rapid technical development, which continuously imposes more exacting requirements, demands also more use of diamonds for the dressing and profiling of grinding wheels is a matter of steadily increasing importance. Also the tool manufacturers, who make clamping tools for diamonds, endeavour to develop implements which are more suitable for this purpose, not only as regards clamping the tools in such a way that they do not vibrate, but also as regards the extension of the use of diamonds for dressing work. Fig. 1 shows a simple clamping tool,

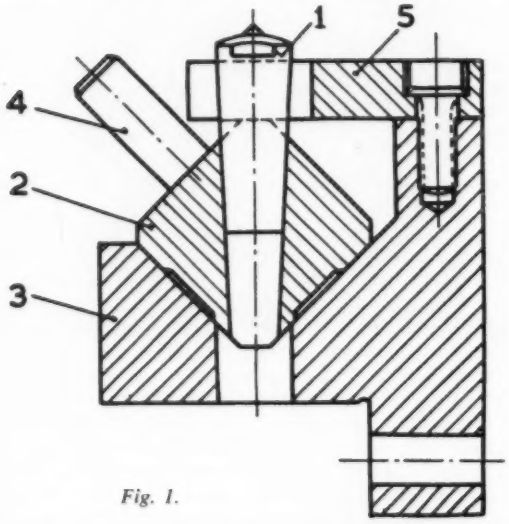


Fig. 1.

which is used mainly on normal surface grinding machines and on universal tool grinders. This implement can be easily made in any toolmaker's shop attached to a workshop. Diamond 1, of carat size 1, is accommodated in clamping block 2, this block resting on support 3. With the aid of pin 4 this block can be reciprocated, and in order to make it slide easily sliding rails are

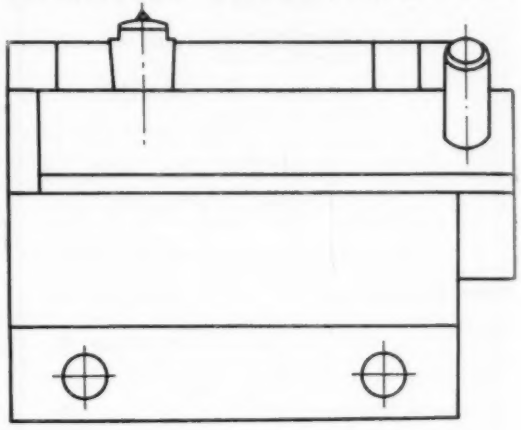


Fig. 2

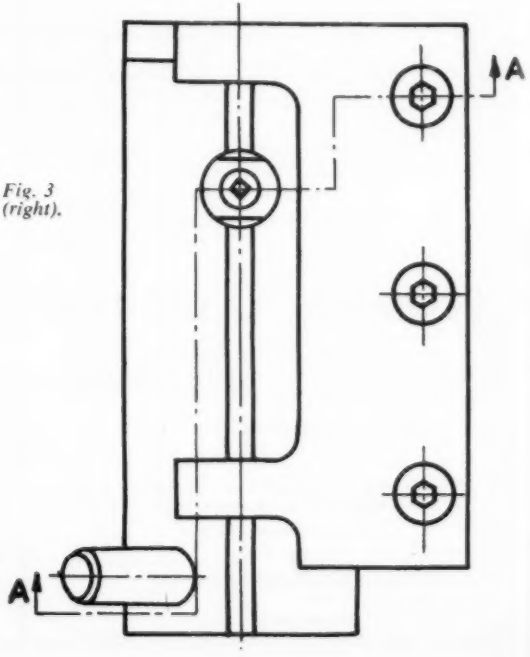


Fig. 3 (right).

arranged in two recesses. Pressure plate 5 holds sliding block 2 in such a way that it can still just about slide, while all the play between the various components has been removed. If now this apparatus is clamped on the sine bar, various different angles can be turned, as required. There is no point in going into any more detail here, because any manager of a works with tool-making shop will know how to arrange these matters. Figs. 2 and 3 show the side and plan view, respectively. Figs. 4-6 show a rather more specialized apparatus, which is commercially available, and also works according to the sine bar system. Here again the angles are set by means of slip gauges, as shown in the illustration. It is obvious that all these methods are only intended for the flat dressing of grinding wheels. For normal surface and universal tool grinders, this occurs anyway quite frequently and in practice it will be necessary to have a device of this nature handy. However, these appliances are not adequate for more specialized grinding work.

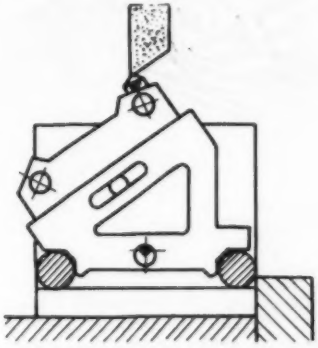
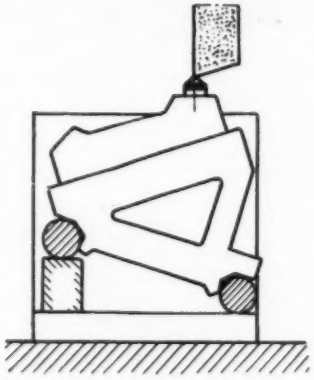


Fig. 4.



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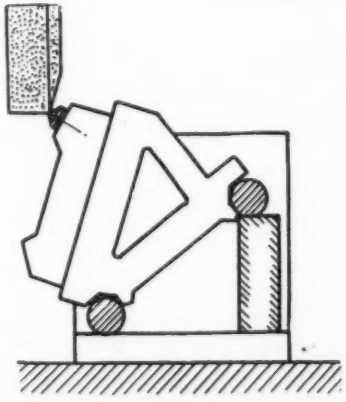


Fig. 6.

Convex, concave, and profile dressing

It happens quite often that a radius is to be formed on a grinding wheel by means of the dressing diamond, particularly on universal tool grinders. This is always an operation which has to be carried out very carefully. It would take too long to discuss all the designs got out for this purpose, we shall discuss here only a few appliances which have produced satisfactory results in practice, and which ensure that the diamond is properly set up, and that the operator can set it without clamping it too much. Figs. 7 and 8 show an appliance which in principle is identical with that of Figs. 4, 5, and 6. The socket block of Fig. 7 (1) is T-shaped. Diamond 3 is accommodated in an arm 2 and this arm is moved by means of a handle 4. For setting to the correct radius an auxiliary arm 5 is mounted on block 1, and the correct radius is adjusted by means of a setting block 6 or suitable slip gauges. Fig. 8, a side view, shows clearly how the convex radius is now obtained. In Figs. 9 and 10 the production of a concave radius is shown, by means of the same equipment, only some components have to be changed over. This illustration shows quite clearly how two half arcs have been made, it can also be seen how an 180° arc can be made. Figs. 11, 12, and 13 show a "Fluidmotion," a very effective radiussing tool, which we have to consider in more detail because it is set in such a

Fig. 7.

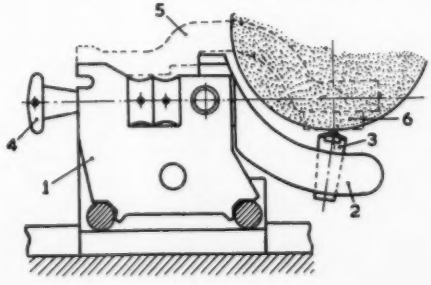
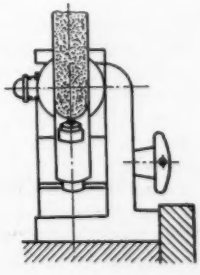


Fig. 8.



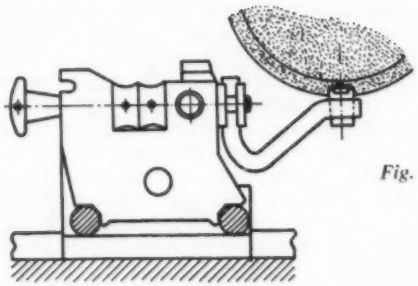


Fig. 9.

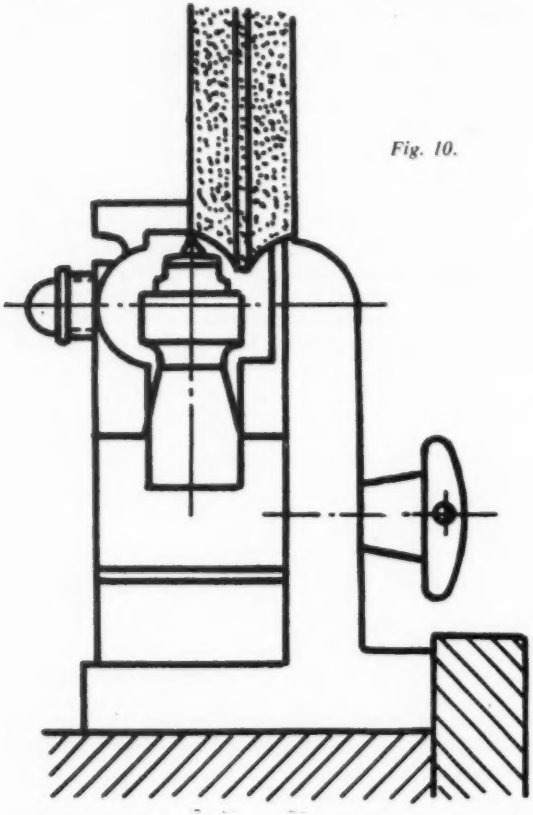


Fig. 10.

simple manner, so that it is very useful in practice. As shown in Figs. 11 and 12, convex and concave arcs can be obtained by setting the radius by means of a micrometer, which has naturally many advantages, not only because it is a simple matter, but also because the operator can set the required radius quickly and reliably. Fig. 13 shows how we can turn by means of this tool given angles in a quite simple manner, because this tool is equipped with an angle scale accommodated in the base plate.

Fig. 11.

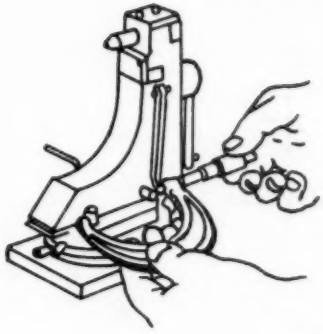


Fig. 12.

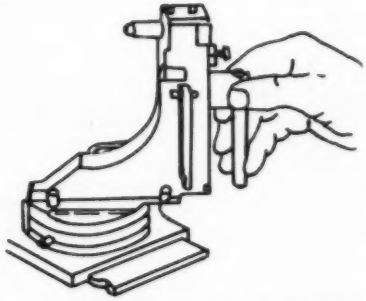


Fig. 13.

The appliances described here for the setting of the dressing diamond enable us to radius the wheel, or to provide it with inclined or straight surfaces of the required shape. But we have not yet come to the matter of special profiles of grinding wheels. It is naturally possible to employ a few tricks, in order to obtain a given profile, but with accurate work this would take up not only much time, but the profile may not be adequate for the purpose. In order to produce such profiles, we have to use one of the appliances designed specifically for this purpose, such as the one illustrated in Fig. 14. If, for instance, in the case of surface grinder a profile is to be cut on the wheel, an appliance as shown in Fig. 14 is put up, behind the grinding wheel, a

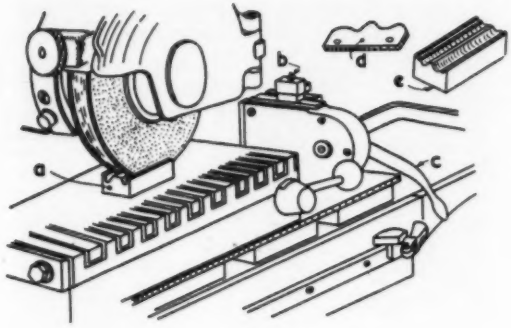


Fig. 14.

shown at 1. If now the profile a is to be cut, the grinding wheel is turned down by means of diamond b to its correct shape. The profile to be cut is controlled by lever c, with the aid of guide d mounted in appliance 1. The guide profile is identical with profile e, the one to be cut. The guide plate is made from a piece of hardened steel plate, and mounted in appliance 1, so that diamond b follows accurately the profile as arm c is moved. It is clear that the profile to be ground must be accurately set with respect to the grinding wheel, so that the dressing diamond can cut the profile by moving only in a vertical direction. However, this is no great difficulty, this is merely a question of setting up the apparatus.

Fig. 15 shows an example of how the dressing appliance 1 can be used for radiussing grinding wheel 3 by means of dressing diamond 2, so that the profile of Fig. 16 can be ground. This tool is ground on a universal tool grinder, not on a special profile grinding machine. For this purpose, the workpiece is first prepared, as shown in Fig. 17, on the appropriate machine. Surfaces a are used for setting up. On table 4 of the grinding machine, a magnetic clutch 5 is placed, on which workpiece 6 is clamped. For the correct adjustment of the workpiece with respect to centre-line x-y of table 4, an auxiliary bar 7 is used. The workpiece is set with the aid of slip gauges 8 in such a way that the centre line of the radiussed portion coincides accurately with centre-line x-y. The correct arc can now be cut by setting the grinding wheel accurately with respect to the dressing diamond in holder 1. Correct overlapping is an important matter while the setting of appliance 1 can be achieved by centering it with the aid of the hole (see arrow a at 1). The grinding motion is carried out by cutting each half arc separately in the wheel

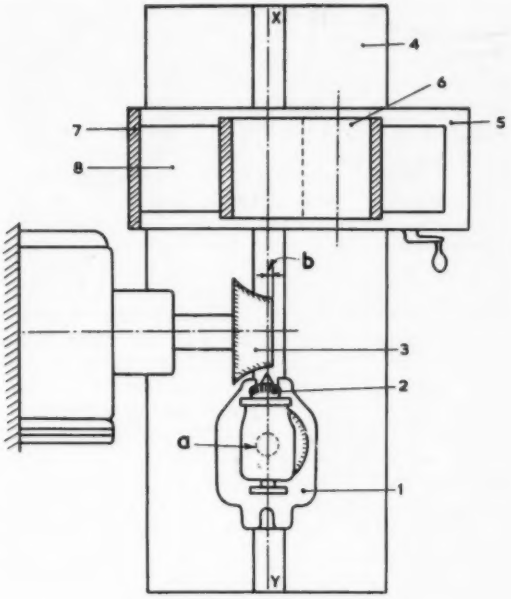


Fig. 15.

profile, *i.e.* R_1 and R_2. R_3 and R_4 are then obtained by turning the workpiece round.

We have given here this description of a combined profile cutting process, in order to illustrate

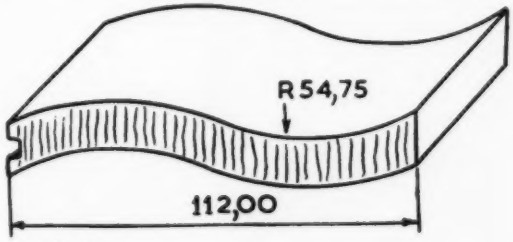
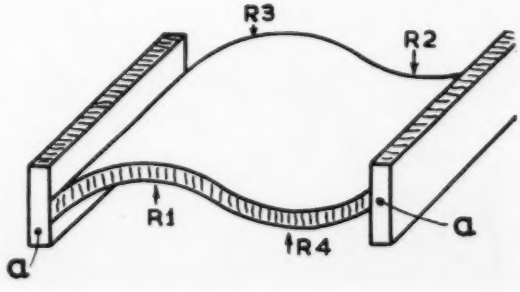


Fig. 16.

Fig. 17.

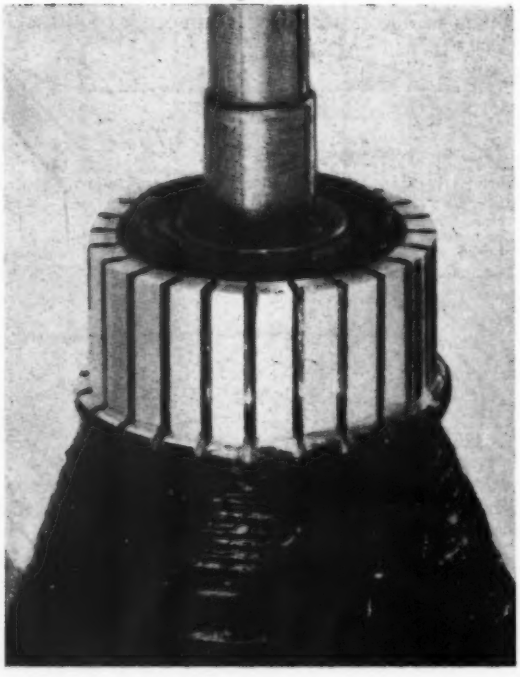


that much can be achieved even on universal tool grinders by means of dressing diamonds. As a matter of fact, by crushing, *i.e.*, pushing in profiles with the aid of steel rollers, much can be achieved as well, however, it appears that when profiling grinding wheels for making tools, *i.e.*, in those cases where simple but accurate work was required, diamond deserves preference. Although we have already mentioned in the previous chapters that dressing diamonds are made with holders with No. 1 Morse Taper, it will be clear that this does not really apply to the special appliances discussed here, which are made with a smaller taper. However, we must point out that there are considerable economical advantages in limiting the various shapes in use to a small number. This is not impossible, and in practice it will be found that two types of holders will be satisfactory, No. 1 Morse taper and a smaller one. In this way we can use the various components on different holders, and it is also much simpler to check the tools, ordering is simplified, and running out of stock is reduced to a minimum.

Special uses of diamonds

We shall now leave the dressing diamonds, although we have not yet described all their uses, since it was only our intention to give a brief survey which, although not complete, will help the reader to orientate himself if necessary. As in the case of diamond grinding wheels, the reader will be aware of the most important factors.

Fig. 18.



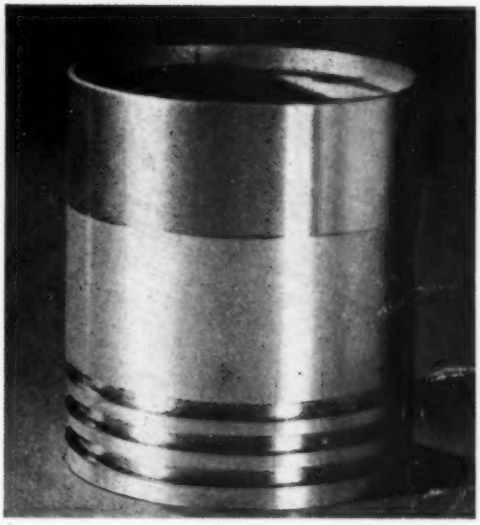


Fig. 19.

But the uses of diamond in industry are not confined to diamond grinding wheels, dressing diamonds, and related matters. We shall briefly deal here with some other common uses, for instance, the diamond cutting tool.

As regards this particular application, we are not referring to heavy cutting on machine tools, because this is not one of the fields of application of diamonds, but we are thinking here of tools with a long service life, which cannot be reached by other cutting tool materials. This implies particularly to the machining of non-ferrous metals, synthetic resins, and in particular also those plastics which have come on the market more recently. One well-known use is the turning down of commutators of vacuum cleaners. Owing to the fact that the copper strips alternate with mica plates, which can be cut only with great difficulty, any tools other than diamond will be blunt after a very short time, since the important matter is not only to keep the tool in service for a long period, but also to maintain a smooth surface, and this is a very difficult matter in this kind of work. When using diamond cutting tools, certain conditions have to be met, for instance, the machine must run perfectly free from vibrations, and speeds of 2000 metres per minute (7000 ft per minute) are not rare. The

feed varies between 0.02 and 0.1 mm, according to the surface finish. For finish-turning the feed is 0.02-0.2 mm. The point of the diamond tool should be level with the centre-line, it should certainly not be below the centre-line. The shape of the diamond tool is naturally an important matter, and for the turning of the commutator shown in Fig. 18 or the aluminium piston of Fig. 19, one should preferably use a diamond tool of the shape shown in Fig. 20. The clearance

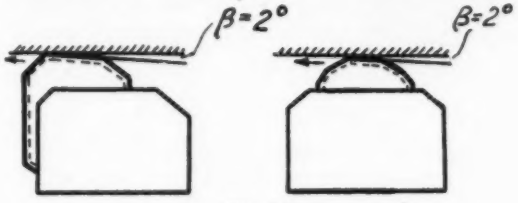


Fig. 20.

angle β is very important, it is normally taken as 2°. If the clearance angle is greater than 2° a flat surface cannot be obtained, and with a smaller clearance angle there is a danger of chattering. For the setting up a microscope has to be used; it is mounted on the tool slide, and a special microscope for this purpose is commercially available.

Many different shapes of diamond tools are available, some of them are shown here, such as the rose-shape in Fig. 21, which has many different cutting edges, and has therefore a long life. In Fig. 21, 1 denotes the rose diamond resting with

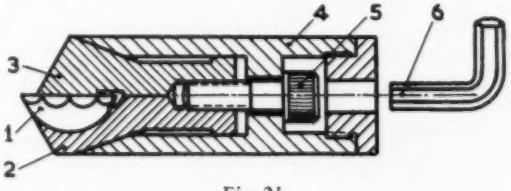


Fig. 21.

its convex face in holder 2. The clamping piece 3 is pulled into clamping sleeve 4 by means of socket-head screw 5 and wrench 6. Fig. 22 shows some other shapes of diamond tools. The uses of diamond tools must be considered carefully because the results may sometimes be quite surprising under good conditions. To mention here only one example, a hard-metal tool used on phosphorbronze has a service life of 35 km (20 miles), while a diamond tool, taking one facet only, will cut over 2000 km (1200 miles). The grinding of the diamond tool is again a matter for the specialist, and should be done by the manufacturer of the tool. Fig. 23 shows

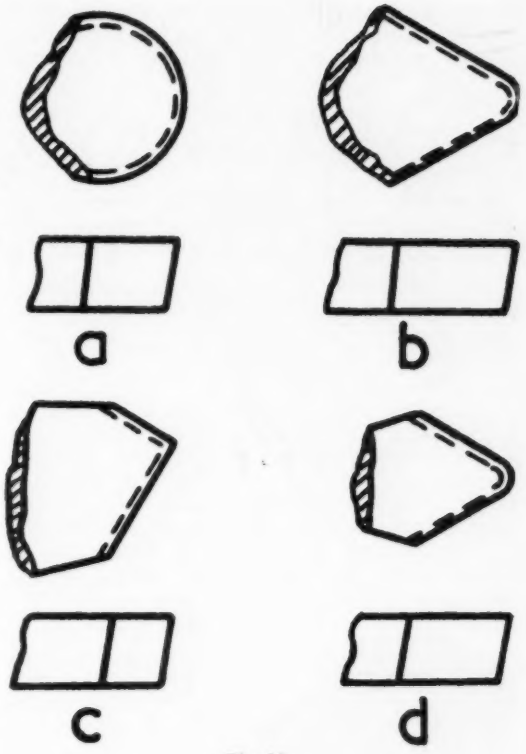


Fig. 22.

lapping bars, impregnated with diamond, an indispensable aid for the sharpening of hardmetal tools. They achieve in many cases in particular with heavy feeds their best service life, if the cutting edge is provided with a land.

Wire drawing dies, an important tool in the production of steel bars and steel rods or wires have also found an important auxiliary in the

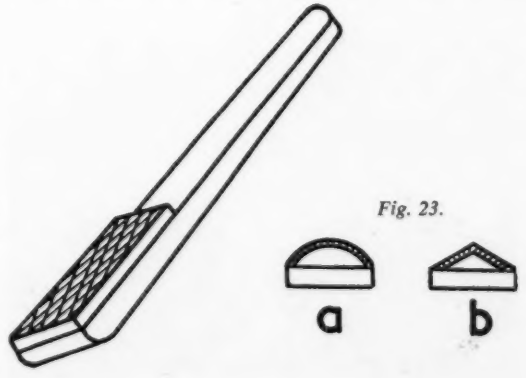


Fig. 23.

diamond. Diamond drawing dies are indispensable in particular for drawing fine wire, down to a gauge of 0.01 mm. Fig. 24 shows the various

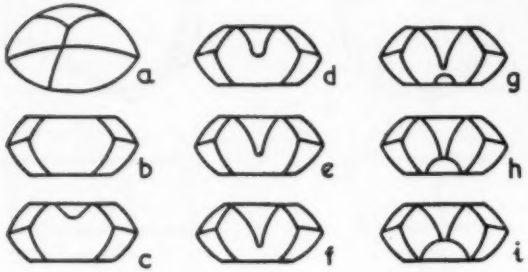


Fig. 24.

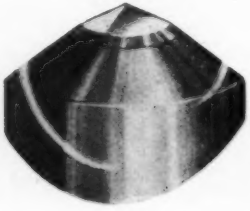
stages in the production of diamond drawing dies (stages a - i). The diamond is ground on one side until the correct lead-in angle is obtained, on the other side the hole is ground out, until the diamond is perforated, and in this way any desired hole diameter can be obtained. Finally, the drawing die is mounted in the holder as shown in Fig. 25, and is then installed on the machine in question.

Fig. 25.

When discussing the uses of diamonds, we must also refer to hardness measurements, because we could not measure hardnesses accurately except by means of diamonds. Fig. 26 shows the Rockwell diamond cone with a vertex angle of 120°, and Fig. 27 shows the Vickers diamond pyramid with a vertex angle of 136°. The mining and oil drilling industries also would not have developed so quickly if the boring crowns of Fig. 28, mounted with diamonds, had not been available. Fig. 29 shows a diamond saw for the production of hardmetal parts, for the

Fig. 26.

Fig. 27.



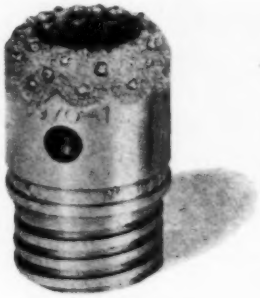


Fig. 28.

Fig. 29 (below).

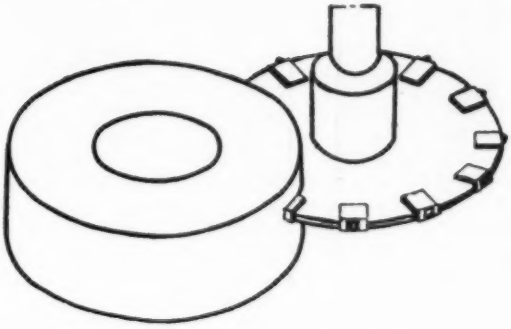
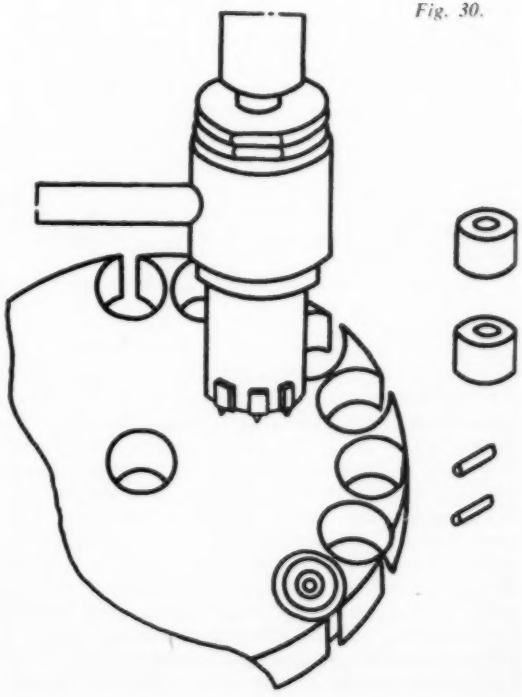


Fig. 30.



marble industry and similar purposes. Diamond presents for these industries continually new applications.

Fig. 30 shows a method of using a drill, the one in this illustration being adapted to drilling out small grinding wheels, which therefore can be made in one's own workshop, out of those wheels which for any given purpose are the most suitable ones. These drills are also quite generally used in the marble and concrete industry. In this case a very convenient system is employed, which is mounted inside the drill, and not only removes the chips, but also improves the service life of the tools.

Diamond and the 'Diprofil' method

"What's in a name?" said Shakespeare, and we could also ask ourselves what is "Diprofil"? This method, called in the trade literature a revolution in toolmaking, has become an indispensable aid for many trades and unavoidably assumed an important position in toolmaking. If we keep in mind that dies for forming metals, in particular moulding dies for non-ferrous metals, plastics, glass, etc., may have all kinds of shapes, which continually have to meet higher requirements, as regards surface quality and dimensional accuracy, it is not particularly surprising that people have endeavoured to find some means of carrying out the numerous manual treatments more quickly.

The high polish of many plastic products, etc., can be obtained only if the die has been made with an extremely high surface finish. The "Diprofil" is an appliance by means of which this can be done mechanically. This appliance can be used for the following operations: filing, lapping, scraping, grinding, honing, engraving, milling, sawing, and chiselling. All these operations, which in the past could be done only by hand, can now be done more easily and more quickly by means of the "Diprofil," and it is again the diamond, which endows this appliance with its versatility. The dies and other tools are usually hardened and can therefore be machined only with difficulty. With the aid of the "Diprofil" and other diamond tools, these operations can be carried out with a high degree of accuracy and surface finish, which could be done in the past only by taking great care, and spending much time on the work, and even then could be achieved only approximately. If now a die-casting die is to be made by means of the "Diprofil," which again invloves the use of a diamond, it will stand up to any criticism and the same applies to the parts made in this die.

Fig. 31 shows the "Diprofil," an appliance which can easily be held in one's hand, and can

Fig. 31.

perform both a rotary and a reciprocating motion. Fig. 31 shows a little diamond file indicated in Fig. 32. Any man experienced in this field knows how difficult it is to correct a die which has distorted after hardening, or to lap holes smooth. The illustration shows quite clearly that the diamond file and the "Diprofil" appliance are extremely suitable for making such corrections quite quickly. The nipples of the dies can also be touched up only with difficulty, if they cannot be entirely ground after hardening. Fig. 33 shows again how this can be done by means of the diamond file and the "Diprofil" unit. If we consider that this work used to be

Fig. 32.

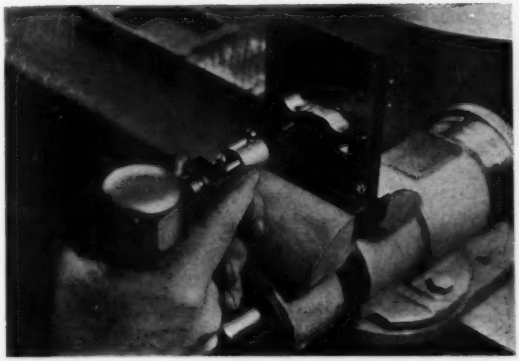


Fig. 33.

carried out by means of a lapping tool or stone, it is clear that it not only took up much time, but the quality of the work also left much to be desired, quite apart from the fact that the work never came out quite straight. The polishing and/or machining of profiles, *e.g.*, for injection moulding dies, which are made by a copy milling process, is carried out by means of the "Diprofil" appliance as shown in Fig. 34. The operator has not only a very good view of the workpiece, but can move quite freely, because the appliance is suspended from a special stand, so that the operator has to hold only the motor with the small handle, in which the auxiliary tools are accommodated. Fig. 34 shows a special small

Fig. 34.

dish, on which diamond paste has been smeared. By smooth polishing with the right kind of diamond powder or lapping paste, a magnificent high polish is obtained. The exchanging of the various auxiliary tools is a problem which has been solved in a satisfactory manner, and can be carried out by way of a single manipulation. There are so many types of work which can be done by means of this appliance with diamond that it would take us too far to investigate them more deeply. We shall therefore confine ourselves to give a summary of the tools which equipped with diamonds will bring about efficient production of tools. We have already mentioned diamond files, which are not only important in the production of dies from high-alloy steel, but are also indispensable in the forming of hard-metal, which without files of this kind cannot be formed. Fig. 35 shows how the appliance is

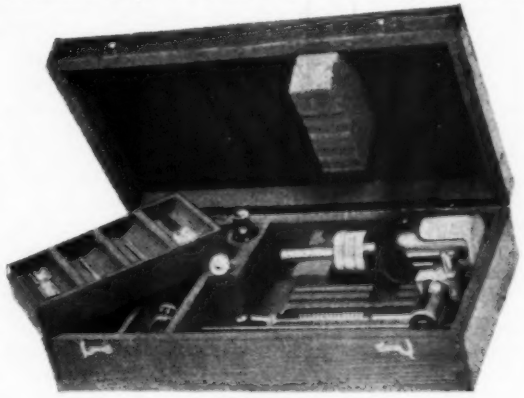


Fig. 35.

kept in a wooden box, which also accommodates various special tools. The motor required to drive the appliance is not put into the box, it is suspended separately, as already explained.

Diamond powder for lapping and polishing

One of the most important forms of the diamond is certainly diamond powder, which is employed for many different purposes. When we consider the preparation of specimens for metallurgical investigations, we cannot omit to mention diamond powder in this connection. This is particularly a question of preparing the specimen without wasting too much time on this operation. Naturally, we can make good specimens without using diamonds, but this takes so long that the process would not be justifiable under industrial conditions, the question of saving time has reached a stage here that daily metallurgical investigations have become a necessity even for small firms. Experience has given

Fig. 36. Diamond lapping paste dispensers and woollen and felt laps all contained in a box made specially for them.

us here many important advantages, so that we are not only convinced of the suitability of the diamond powder for the preparation of specimens, but everybody is beginning to realize also that this is an economical necessity. Diamond powders are therefore being made in all degrees of fineness, and supplied in tubes or special dispensers. These dispensers are sometimes quite well designed, so that not only the correct quantity can be dosed out, but the rather expensive material is used as economically as possible. We can assume that the reader is acquainted with the fact that the diamond powder or paste is applied to a special kind of felt, for the preparation of the specimens, the felt being fixed to a rotating disk. In order to achieve the best performance with diamond paste, a diluent must be added, which is also commercially available in various types and grades. The uses of diamond paste in connection with the "Diprofil" method are so many that it is impossible to deal even with a small part of this extensive field. We must confine ourselves to mentioning only a few examples, of a certain field. Naturally, in every shop some special applications will be found. In order to mention only a few aids by means of which good results can be achieved in conjunction with the "Diprofil" method, we can take the special moulds of Figs. 37 and 38. They enable us to carry out mechanically or manually lapping motions on injection moulding dies, or die-casting dies. On the concave or convex surfaces a piece of felt is fixed, and charged with diamond powder. This appliance enables us to carry out rotary and reciprocating motions,

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Fig. 37.

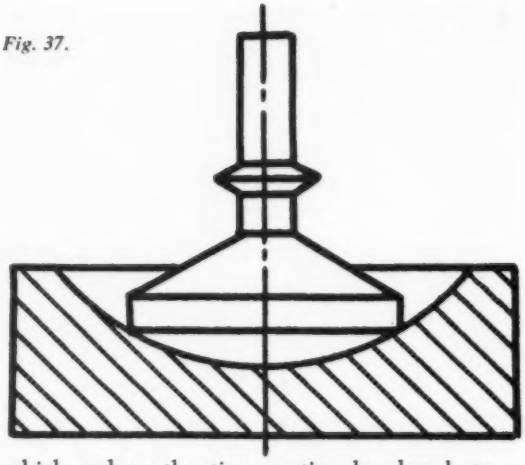
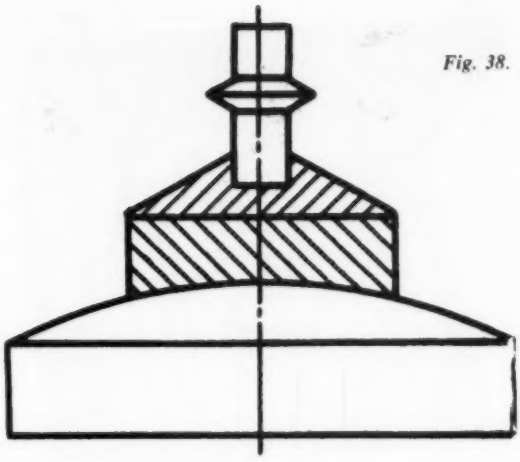


Fig. 38.



which reduce the time-wasting handwork to a minimum. This is also the only economical method of applying to alloyed or hardened dies the high-polish finish, which is so necessary to achieve good results. It is difficult to appreciate the importance of "Diprofil" and diamond paste if one has not actually been doing this sort of work by hand. Fig. 39 shows a flat auxiliary

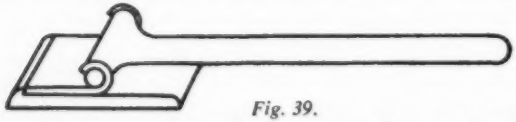


Fig. 39.

piece, by means of which flat surfaces can be finished. Fig. 40 shows a diamond wheel at work, grinding out a piece of hardmetal. Fig. 41 shows the diamond file used in conjunction with the "Diprofil" appliance. All kinds of shapes and forms of these files are commercially obtainable. Fig. 42 shows a special example, removal of a broken tap by means of a diamond grinding point.

We now have to leave the field of the "Diprofil" appliance, although it would be intriguing to

Fig. 40

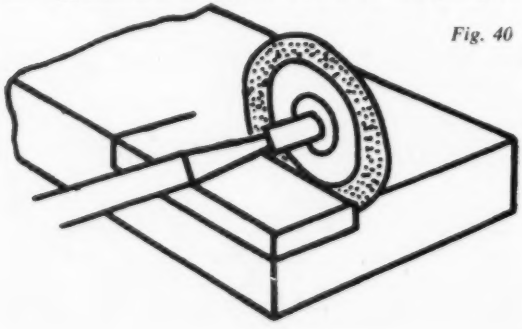
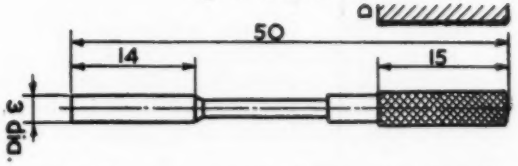
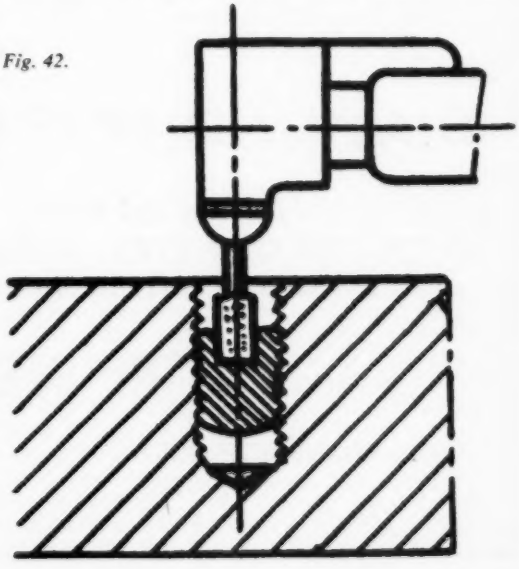


Fig. 41 (below).



quote a few more practical examples, but this would take us too far. It has been very interesting to investigate the industrial uses on a very large field, particularly because we have been following this development in firms of different sizes, and we had to come to the conclusion that

Fig. 42.



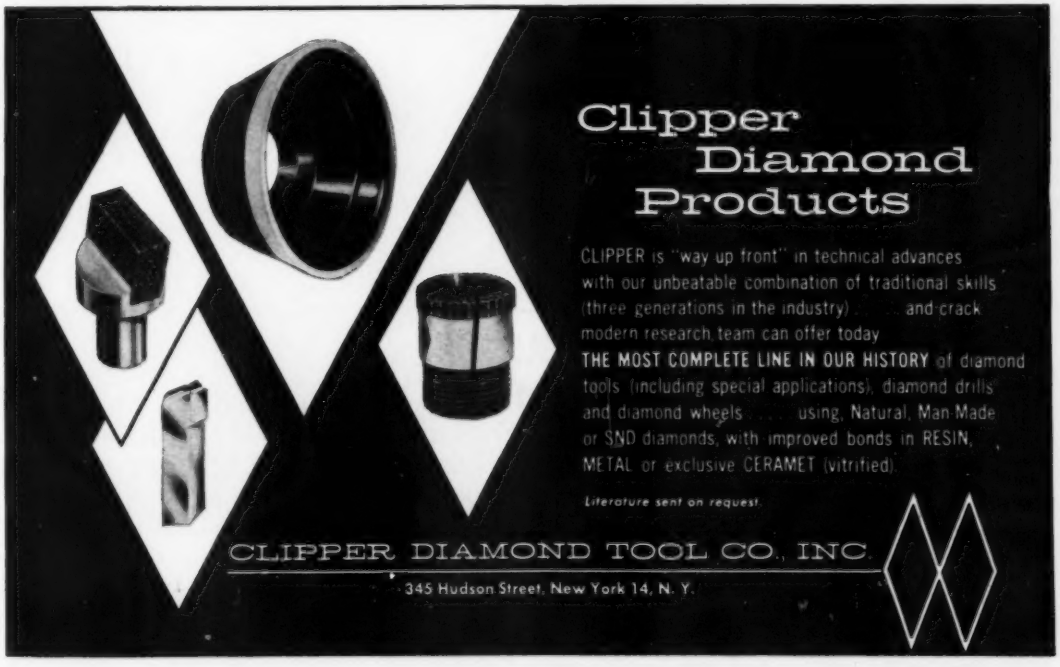
in many fields technical development had been retarded by the lack of diamonds. Further development and further advances in technology will therefore involve the use of diamonds on an even larger scale, because this stone, so much sought after for centuries, is so hard. In a following chapter we shall deal with a method developed specially for the production and grinding of hardmetal grinding guide plates by means of diamond grinding wheels; this operation is carried out on a normal surface grinder or tool grinder.

Prospecting in North Yakutia

The Institute of Arctic Geology, of the U.S.S.R., has sent an expedition to North Yakutia to prospect for new diamond deposits. It will explore an area of more than 3,800 square miles in the basin of the River Birekte. The expedition will use planes, helicopters and cross-country vehicles to transport geologists to areas that are difficult to reach.

In 1960, ten times as many diamonds were mined in Yakutia as in 1957. Prospecting is to be on a wide scale and diamond production is expected to show a 25-fold increase by 1965. The chief kimberlite reserves already being worked in the territory are the Mir (Peace) and Udachnaya (Lucky) pipes. Alluvium quarries, kimberlite ore mines, crushing installations and extracting plant are already operating, and a concentration mill in the Mirny district will be processing hundreds of tons of ore daily by 1965. A big extraction combine will be constructed near the Udachnaya pipe in the next few years. Yukutia will get electricity from a hydropower station, the first section of which will start operating on the Vilyui in three years time. A transmission line will link the station with Mirny, Daldyn and other diamond centres, and with the port of Mukhtuy.

The exploitation of the very rich Aihal kimberlite pipe discovered in Yakutia in 1960 will start this year.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It finish grinds to fine limits any profile within its capacity and with a number of attachments has proved particularly suitable for grinding irregular shaped contours on flat or tangential form tools, male or female profile gauges, punches, and die segments, in any material including tungsten carbide.

The Wickman optical profile grinder.

The grinding wheel is carried on a head which is mounted on a series of slides and circular guides, permitting the wheel and the traversing slides to be positioned to almost any desired angle. The wheel may be held for circular work, or it may be reciprocated for straight work.

When the machine is being used to grind irregular profiles, a 50 : 1 drawing of the desired profile is mounted on the drawing table of the machine and is used in conjunction with the pantograph system. The pantograph imparts a 50 : 1 reduction to its final arm in which is incorporated the projection unit. The viewing screen of this unit has two crossed-hair lines, the centre of which follows the path of the pantograph tracing point.

The microscope in the final arm of the pantograph is positioned on the work in precise relationship with the drawn 50 : 1 layout, and grinding proceeds by manually feeding the image of the grinding wheel to the centre of the cross-hairs, seen in the graticule of the microscope. Wear of the grinding wheel is, therefore, unimportant and does not effect the accuracy of grinding.

A 50 : 1 ratio of reduction between drawing and work enables a drawing error of 0.010 inches to be reduced to 0.0002 inches on the workpiece. With care, drawings can be produced with a maximum error of 0.005 inches on aluminium laminated drawing paper, which is said to be immune to temperature and humidity changes and to have long keeping characteristics.

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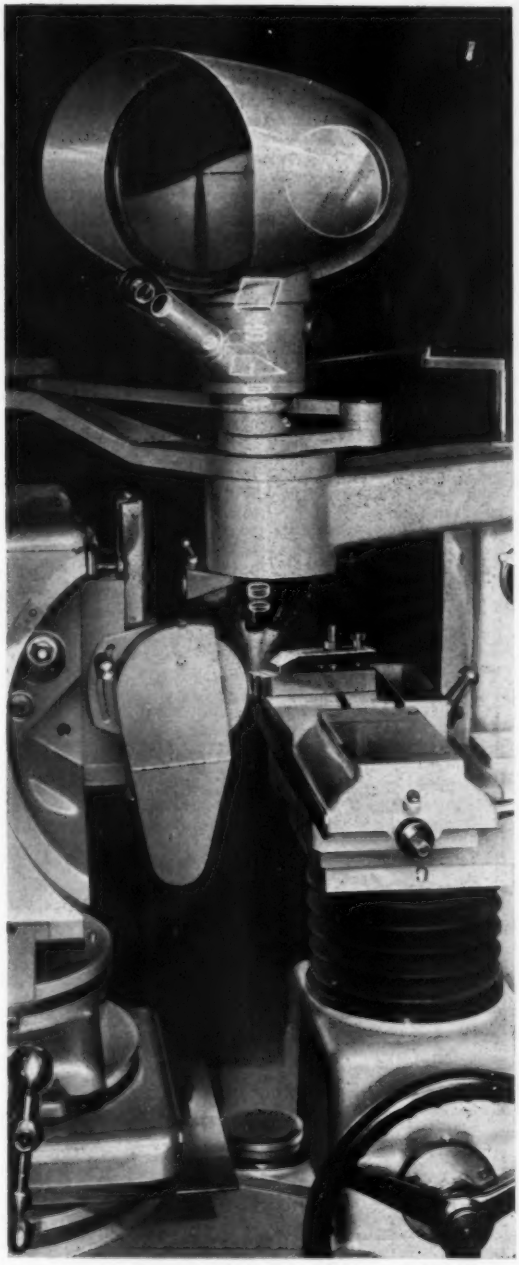

The projector of the Wickman optical profile grinder, showing two sources of work illumination; the surface illumination unit consisting of five 2.4 watt lamps mounted in the projection unit and fixed on the work immediately beneath, and the main projection illumination unit mounted in the base of the machine. The photograph also shows a mirror and magnifying system.

In earlier models of the grinder a x 25 microscope only was fitted, but new models are now being fitted with a x 50 microscope as an extra.

Tanganyika

According to an announcement by Mr. Nsilo Swai, Minister for Commerce and Industry in Tanganyika, Williamson Diamonds Ltd. spent over £200,000 in 1960 at their Mwadui property on housing, a school, a community centre and sewerage. The Minister also stated that, in the next two years, a further amount of £600,000 is to be spent on community services. The lowest cash wage is 143s. a month, and the present average wage of 216s. is claimed to be twice the rate in the neighbourhood.

Meanwhile, diamond production in Tanganyika in February of this year totalled a mere 78 carats worth £727, as compared to 55,344 carats worth £519,300 in February 1960. This brings the total for the first two months of this year to 62,532 carats worth £498,292, as against 101,335 carats worth £934,238 in the corresponding period of 1960.

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DIAMOND MINING AND INDUSTRY

The prospects in Namaqualand

Anon. *Diamond News* 1961 Vol 24 (6) pp 3-4 (Mar)

The Minister of Mines has decided to form a State-controlled corporation to undertake the prospecting of diamonds in Namaqualand and adjacent areas. The likelihood of diamond fields being discovered is discussed. *L* *Eb.12.361*

Diamonds found in Russia : exciting story of their development

Anon. *Diamond News* 1961 Vol 24 (6) pp 13-15 (Mar)

With the recent report of a new diamond field discovery, there are now eleven maior diamond deposits in Russia. If the fields are as valuable as the reports suggest, the annual Russian yield may, in a few years, challenge the entire African output. It is suggested that the Russians should keep the new fields as reserves for the future. *L* *Eb.13.33*

Growing market for industrial diamonds

Anon. *Diamond News* 1961 Vol 24 (4) pp 20-21 (Jan)

The findings of a New York report on the constantly growing market for industrial diamonds. A big reason for the growth is the increase in grinding operations. Also mentioned is the progress made in metal cutting, removing and finishing, and also in diamond turning and boring of aluminium, bronze, and copper. Other uses of diamonds in metalwork are listed. Although the initial cost of diamond tools is much greater than conventional tools, diamond spokesmen claim the savings come from the greater life of diamonds, labour saving because of fewer tool changes, faster machinery rates, better finishes, and less frequent gauging.
E *Ceq N/Fc.251*

Basuto's diamond area ' secret '

Anon. *Gemmologist* 1961 Vol 30 (357) p 78 (Apr)

There now seems to be little doubt that large and valuable deposits of diamonds do exist in Basutoland, but the concessionaires have so far not considered it necessary to issue comprehensive reports on their operations. Some time ago the De Beers group entered into an agreement with Col J. Scott under which an interest would be acquired by Be Beers in the Basuto-land concession. *X* *Eb.361*

[Diamonds in Africa]

Anon. *Miner Tr Notes* Vol 52 (4) pp 14-20 (Apr)

The diamond industry in the Congo, Ghana, and Tanganyika is discussed. In Tanganyika the monopoly of Williamson Diamonds Ltd has ended, and prospect-ing has been opened to qualified world mining concerns. Diamond synthesis in South Africa is also dealt with.
L *F.25.36*

Diamondiferous jottings

Anon. *Diaco Digest* 1960 Vol 4 p 6 (Aug)

Describes the cast aluminium deck grease table used in the recovery of diamonds. The sorting operation is briefly outlined. *W* *F Hg Ja*

All quiet on the alluvial diggings

Anon. *Gemmologist* 1961 Vol 30 (357) pp 77-78 (Apr)

Reviews the situation on the alluvial diggings.
E *Ebe.361*

An April Fool's diamond

Anon. *Gemmologist* 1961 Vol 30 (357) pp 76-77 (Apr)

Reviews the production of the Star Diamonds (pty) Ltd, a private company controlled by New Union Goldfields, Ltd. It is claimed that the mine produces gem diamonds with the highest average quality of any in the Union. *E* *Eb Hd.361*

Deposits of precious stones : Notes on Alamasi diamond mine

A. J. King. *Rec geol Surv Tanganyika* 1958 Dar-es-Salaam Vol 18 pp 63-66 diagr : *IMM Abstracts* 1961 Vol 11 (3) p 70 (Feb-Mar)

Notes on the history of working the mine, in Shinyanga District, the results of a 1949 geophys survey, and geol information revealed by excavation since 1949 with special reference to the genesis of the deposit. *X* *Eb Hd.364*

Diamond

J. F. Shaw & others, Foreign Service Despatch, 297, Nov 25, 1960, Tel Aviv, Israel. *Miner Tr Notes* 1961 Vol 52 (3) p 14 (Mar)

The new diamond centre sponsored by the govern-ment-controlled Diamond Development Corp, and the Jerusalem Economic Corp, was opened in Jerusalem at the end of 1960. The diamond industry of Israel is expected to expand considerably.
L *F.25.351*

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USSR's new method of finding diamond pipes

Anon. *Diamond News* 1961 Vol 24 (6) p 21 (Mar)

It is reported that a new method of locating diamond pipes has assisted in the quick development of the Siberian diamond fields. The method is based on the statistical distribution of river-bed diamonds considering size in relation to the pipes from which they came.

L *Eb.12.1456.33*

Another diamond pipe discovered by Soviet

Anon. *Diamond News* 1961 Vol 24 (4) p 21 (Jan)

Another, even larger pipe of diamonds, has been discovered in Yakutia, and has been named Aikhal. The diamond workers plan to increase diamond mining by twenty-five times during the current seven-year plan, instead of the sixteen times formerly envisaged.

L *Ebc.12.332*

Exploitation of new soviet field expensive

Anon. *Diamond News* 1961 Vol 24 (6) p 23 (Mar)

The development of the new diamond field is expected to be very difficult and expensive. The region cannot be reached over land during summer, and winter temperatures can reach almost 60° F below zero. The area is regarded as being very important, and mechanical equipment is expected to be in operation within a few months. *L* *Eb.132.33*

Prospecting agreement

Anon. *Diamond News* 1961 Vol 24 (4) p 21 (Jan)

Under the prospecting agreement between the Diamond Corporation of Sierra Leone Ltd and the Government, the Corporation will bear prospecting expenses and these will be refunded from the proceeds of the sale of diamonds recovered. The Diamond Corporation will work as an agent of the Government and will not seek diamond mining rights.

L *Eb.12.3672*

Diamonds

Anon. *Min Mag, Lond* 1961 Vol 104 (4) p 198 (Apr)

It is reported from Johannesburg that preparations are in hand for re-opening the Kimberley mine of De Beers Consolidated, closed since 1908.

Shareholders of De Beers have been informed that owing to a revision of selling procedure introduced on Jan 1, any comparison between current and earlier sales of gem and industrial diamonds has been invalidated. In addition, automatic classification of sales into gem and industrials has become impossible, and it has been decided to discontinue the practice of announcing the quarterly sales of gem and industrial stones in subdivisions. *X* *Eb Hd.3612*

Diamond : South-West Africa

Anon. *Miner Tr Notes* 1961 Vol 52 (1) pp 15-17 (Jan)

Gives some details of production figures and exploration activities in South-West Africa, and some information about the production of synthetic diamond in South Africa. 3 tables.

E *Eb.12.362/Fh Ha.361*

DIAMOND TECHNOLOGY

First published 1942 as " Production Methods for Diamond and Gemstone." The second edition of this book by P. Grodzinski has been revised throughout and considerably enlarged. 840 pages, 486 illustrations, 94 tables, and indexes. From NAG Press Ltd., 226 Latymer Court, London W 6. 55s 0d, post free.

PHYSICAL, CHEMICAL, & MECHANICAL PROPERTIES OF DIAMOND

Progress in nonmetallic materials

Anon. *Metal Progr* 1961 Vol 79 (2) p 68 (Feb)

Briefly surveys developments in the manufacture of synthetic diamonds. 1 illustr.

K *Fh Ha*

Beware ! diamonds painted, irradiated or coated

Anon. *S Afr Jeweller* 1961 Vol 24 (4) pp 16-17 (Jan)

Irradiation is used to intensify or add colour to diamonds, and as far as it is known, the result is permanent. Jewellers are, however, warned against temporary colouring of diamonds, painting being the simplest method which can appear quite effective on set stones. The chief problem is said to be the new coating treatment of diamonds, which serves to neutralize the yellow in off-colour stones. The coating process is said to be fairly simple, and there is no known means of recognising coating without removing it.

L *F Hx/F Hz*

The Minidigest

Anon. *Engrs' Dig* 1961 Vol 22 (3) pp 6, 8 (Mar)

Synthetic diamonds up to 1 ct in size can now be produced ; they are not yet sufficiently robust for industrial purposes, and work on them is continuing.

W *Fh Ha*

Man-made diamond testing increases versatility and efficiency

N. A. Matthews, N. L. Leventhal. *Grinding & Finishing* 1961 Vol 7 (3) pp 32-34 (Mar)

Two tests for the friability of synthetic diamonds have been introduced. Statistically significant results are obtained by collective testing of weighed quantities of diamonds rather than individual grains.

In the first test the diamonds are compressed between opposed pistons in a carbon die ; pressures range from 5,000 to 10,000 lb/sq inch. The diamonds are then rescreened and the percentage breakdown is calculated. Bridging and allied effects reduce the efficiency of this technique, and the 'Wig-L-Bug' test is more efficient. In this test, the diamonds are placed in a 7/16 in. diameter × 1 in. long steel capsule in company with a ¼ in. diameter Plexiglass ball. The capsule is then oscillated through an amplitude of ½ in. at frequency of 60 cycles/second. After a timed cycle the diamonds are re-sieved and the percentage breakdown calculated

For general purposes, a 25% breakdown in average particle size is the preferred criterion. This is determined by comparing the quantities retained in different sieves during screening, and an arithmetical particle size is calculated for each screen opening. If comparisons are to be made on the basis of a 25% reduction in sieve openings, interpolation is generally necessary between the results on two screens. In the case of an 80/100 mesh fraction, the calculation to determine the Friability Index is :

$$\frac{\text{Wt through 120 mesh}}{\text{original total}} \times 100 = \text{Friability Index in \%}$$

Grinding performance of a single sieve fraction of diamonds is correlated with their Friability Index, and the optimum strength level in relation to grinding performance can be determined from tests with several friability levels. Tests show that synthetic diamonds thus selected can out-perform natural diamond in a variety of bonds. 4 illustr, 1 table.

W *Fh:Cveg.1456*

Gemstones

Sir L. Bragg. *Proc Roy Inst of GB* 1958 Vol 37 Pt 1 (165) pp 1-15

Gemstones exist in a great number of varieties, but if they are classified by their fundamental crystalline forms, there are only ten kinds of crystal which are commonly cut as gems. They are diamond, corundum (ruby and sapphire), garnet, tourmaline, zircon, beryl (emerald and aquamarine), topaz, spinel, chrysoberyl (alexandrite, cat's eye) and olivine (peridot). Physical properties which make minerals suitable for gemstones are discussed. Hardness is an essential property. After a general discussion, the gem families are dealt with individually. The property which gives the diamond outstanding importance is its high refractive index. 6 illustr, 8 ref. *L* *Bb Uc/F Uc*

Report on the Crystallographic Conference at Leningrad, May 21-27, 1959

L. O. Brockway. Unpublished report by author at University of Michigan, Ann Arbor, Michigan: *LLU Transl Bull* 1960 Vol 2 (1i) p 995 (Nov) LLU shelf mark: V38

X *Vh.231.33*

Technical Bulletin No 1: Realistic tests provide indisputable proof of SND (selected natural diamond) superiority in peripheral surface grinding operations with resin-bonded diamond wheels

Engelhard Hanovia, Inc, Industrial Diamond Div, 113 Astor St, Newark 2, New Jersey. 5 pp, 8½ × 11 in., illustr

Summary of results from comparative tests of Synthetic and SND (Selected Natural Diamond) peripheral resin-bonded wheels in wet grinding operations on carbides. Results are shown in terms of wheel life and wheel output, cutting ability, and surface finish.

The results, overwhelmingly in favour of SND, are summarised in the table below:—

DIAMOND ABRASIVE PERFORMANCE INDEX

Analysis of surface grinding test results to measure comparative performance of selected Natural Diamond (SND-RB) and Synthetic Diamond (RVG) in 150 and 100 mesh sizes.

Category	Mesh Type and Size	SND Results show:
Wheel life and output.	SND-RB 150	Up to 35% greater wheel life and output.
	SND-RB 100	Up to 123% ...
Freedom of cut.	SND-RB 150	Equivalency.
	SND-RB 100	40% less freedom of cut.
Surface finish results.	SND-RB 150	Up to 20% High quality surface finish.
	SND-RB 100	Up to 40%.

W *Chem Nv Urb*Chem Nvh Urb*

Artificial coloration of diamond

F. A. Raal, (Diamond Research Lab, Johannesburg). *Gemmologist* 1961 Vol 30 (357) pp 63-66 (Apr)

Deals with diamond colours obtained artificially, particularly by electron radiation, gamma irradiation, and neutron bombardment. Also covered is how diamonds, coloured in this way, can be distinguished from those having natural colours. Other methods of colouring are mentioned. 8 ref, 1 table.

E *F Hx*

Colour and artificial colour changing of diamond (II). Farbe und künstliche Farbveränderung von Diamanten (II)

E. Gübelin. *Dtsch Goldschmiede Ztg* 1961 Vol 59 (3) pp 130-133 (Mar) (In German)

Two methods employed in changing the colour of diamonds are discussed, and their effect on the diamond considered. Electron radiation induces a bluish or bluish-green colour, different from the natural blue. To retain the colour the electrons are low powered, and do not penetrate deeply; thus only surface coloration is produced. Gamma rays penetrate deeply, however, and their use colours the diamond completely. Gamma rays can also be used to reduce the colour of certain pale diamonds, rendering them colourless. 7 illustr. To be cont.

A *F Hx*

Examination of granulametric distribution in pulverized aggregates. Untersuchungen über die Korngrössenverteilung Feingebrochener Materialhaufen

J. Lázár. *Acta Tech hung* 1961 Vol 32 (3-4) pp 325-339 21 illustr, 9 ref. *M* *Qt.21*

Some observations on the synthesis of diamonds

H. Liander, E. Lundblad. *Ark Kemi* 1960 Vol 16 (9) pp 139-149 (Apr 13)

The results of the experiments made by the General Electric Co of America on the high-pressure, high-temperature synthesis of diamonds, are compared with observations on similar experiments made at Asea in Sweden. 12 illustr. *L* *Fh Ha.329*

USP 2,947,609 (Jan 6, 1958) **J. M. Strong, General Electric Co**

Diamond synthesis

The diamond synthesis carried out according to an earlier method required pressures of at least 75,000 atm. It has been found that it is possible to work with a pressure as low as 50,000 atm which may be raised to 115,000 atm at temperatures between 1200 and 2600° Centigrade. The new process is preferably carried out at pressures between 70,000 and 100,000 atm in a temperature range between 1400 and 1800° Centigrade. The conversion is effected in the diamond stable region of the carbon phase diagram in the presence of a preformed alloy of a metal as a catalyst selected from the class consisting of iron, cobalt, nickel, ruthenium, rhodium, palladium, osmium, iridium, platinum, chromium, tantalum and manganese. 12 claims, 4 illustr. Ref cited: 1 BP; 13 books and periodicals.

J *Fh Ha.545*

USP 2,947,611 (Jan 6, 1958) **F. P. Bundy, General Electric Co**

Diamond synthesis

The synthesis is effected in the presence of platinum as catalyst at a pressure of at least 90,000 atm and at temperatures of from 2050 to 2500° Centigrade. Although graphide is the preferred carbonaceous material the method may be carried out with amorphous carbon, coal, coke, charcoal, *etc*, or with carbon containing organic and inorganic compounds (coal tar, pitch, wood, paper, *etc*). A preferred ratio is about 0.15 part of carbonaceous material per part of platinum. 4 claims, 3 illustr. Ref cited: 1 BP; 11 books and periodicals. *J* *Fh Ha.545*

LITERATURE REQUESTS
When applying for the loan of literature abstracted in this journal, please quote the title of the article, the name of the author, and the number of the page on which it appeared.

USP 2,947,608 (Aug 29, 1955) **H. T. Hall, General Electric Co**

Diamond synthesis

The synthesis is obtained by heating non-diamond carbon (graphite) under high pressure, at least 75,000 atm in the presence of a catalyst, iron tantalum nickel, for a time sufficient to cause an inflection, *ie* a marked change in the electrical resistance of the mixture indicating melting of the catalyst and incipient diamond formation. Pressure and temperature are then reduced

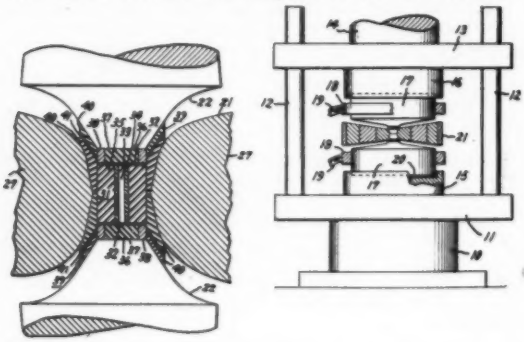


Fig 1 (left) and 2 (right). USP 2,947,608.

in response to this inflection. This newly discovered inflection may also be used for making the operation automatic. Fig 2 is a front elevational view of a hydraulic press to carry out the method. Members 17 between opposed pistons 15, 16 receiving electric current through rings 18. 21 is a pressure resisting multi-ring structure tapering inwardly to a central aperture. This central aperture, as shown in Fig 1, contains specimen holder 31 with the graphite reaction vessel 33 holding a powdered mixture of graphite and catalyst or a rod of the catalyst material. A pressure of 95,000 atm is preferably employed and the diamond conversion could be obtained within a few minutes. 10 claims, 4 illustr. Ref cited : 1 BP ; 10 books and periodicals.

J *Fh Ha.545*

USP 2,947,610 (Jan 6, 1958) **H. T. Hall, H. M. Strong, R. H. Wentorff jun, General Electric Co**

Method of making diamonds

It has been discovered that the common types of carbon such as coal, coke, charcoal or graphite may be readily and rapidly converted into diamond at pressures of at least 75,000 atm, specifically 95,000 atm at temperatures between 1200 and 2000° C, preferably 1400 to 1800° C using as a catalyst a member selected from the class iron, cobalt, nickel, rhodium, rubenium, palladium, osmium, iridium, chromium, tantalum, manganese, and compounds of these metals which decompose to a metallic form at the elevated temperatures and pressures employed. The compounds include *eg* carbide, sulfides, carbonyls, cyanides, ferrotungstates, ferritungstates, oxides, nitrides, nitrates, hydrides, chlorides, molubdates, arsenates, acetates, oxalates, carbonates, chromates, phosphides, permanganates, sulfates, tungstates, *etc* ferrous sulfide, iron carbonyls, palladium chloride, chromium carbide, tantalum hydride, nickel, permanganate, cobalt acetate are mentioned as specific examples. The proportions of the various ingredients do not seem to be critical though it has been preferable to have present more by volume of the carbon than of the catalvst material. 18 claims, 3 illustr. Ref cited : 2 USP ; 1 BP ; 11 books and periodicals. *J* *Fh Ha.545*

PHYSICAL, CHEMICAL, & MECHANICAL PROPERTIES OF HARD MATERIALS

Ceramic tools, properly applied shown to have important future

Anon. *Canad Mach* 1961 Vol 72 (4) pp 176-178 (Apr)

Swiss research points up successes in copy turning on slender work with interesting savings. Even interrupted, irregular cuts need not be impossible. 1 table.

X *Ceqbz Pdd*

Hungary : fine ceramics

Anon. *New Sci* 1961 Vol 10 (230) p 41 (Apr)

The finer the sintered alumina powder used for ceramic-tipped tools and metal-working dies is, the tougher and more durable is the tool. The fine grain structure of the alumina can all too easily be destroyed during sintering. A new process is described which is said to overcome this difficulty, and produce alumina particles with diameters considerably less than ten thousandths of a millimetre.

L *Al Bl Cql.1456*

Effect of the built-up edge on a cutter, on the surface quality of aluminium alloys

V. B. Livshits. *Machines & Tooling* 1960 Vol 31 (11) pp 29-31 (Nov)

The formation of the built-up edge on cutting tools considerably impairs the quality of the machined surface, and makes the final finishing process less satisfactory. Investigations were carried out on aluminium alloys which were turned with tools tipped with VKh8 alloy. 7 illustr, 3 ref.

L *Bfxc Ceqb Pd.21*

Abrasive for billets. Developed for heavy duty

Norton Co, Worcester, Mass, USA. *Canad Mach,* 1961 Vol 72 (3) p 93 (Mar)

Alundum 75 is a new aluminium oxide abrasive developed for grinding billets and slabs of stainless steel. Fast rate of cut and long wheel life, it is claimed, reduced the total cost/lb of metal removed by as much as 40 per cent. *E* *Bfcbc Chc Pe.Rj*

DIAMOND, ETC, IN INSTRUMENTS

Italian tool design swings to automatic controls and Standardization

G. DiRaimondo, Milan Bureau. *Prod Engng* 1960 Vol 31 (50) pp 15-17 (Dec)

Describes trends at the second International Machine Tool Show in Milan. Among equipment exhibited was a Nova electronic sizing device for the firm's internal grinders, which is said to allow sizing tolerances as close as 0.00016 inch. A diamond-tipped feeler is part of the unit. 4 illustr. *L* *Ndb Psfz.27*

DIAMOND TECHNOLOGY

First published 1942 as " Production Methods for Diamond and Gemstone." The second edition of this book by P. Grodzinski has been revised throughout and considerably enlarged. 840 pages, 486 illustrations, 94 tables, and indexes. From NAG Press Ltd., 226 Latymer Court, London W 6. 55s 0d, post free.

Crystal Wafer Slicer

Fitchburg Engng Corp, Fitchburg, Massachusetts. *Sol St Abstrs* 1960 Vol 1 (1) p 45 (Oct)

A machine which can automatically slice a semi-conductor ingot up to 4 in. in length after an operator positions the machine for the first cut is announced. Slices with thicknesses down to 0.007 in. ±0.0005 in. can be cut. If desired for special work such as rate-grown crystals, the machine can be operated by hand. A controlled adjustable speed spindle drive allows for variations in diamond wheel size and quality and for differences in semi-conductor materials.

X *Bde Cej Nv Pr*

BP 842,510 (Mar 13, 1958) **B. Benjamin, Cosmocord Ltd**

Gramophone Pickups

Styli are usually made from the hardest available materials (artificial sapphire, diamond) to reduce wear. It is proposed to make styli of polytetrafluoroethylene which has a very low coefficient of friction in contact with the vinyl material of which modern long playing records are made. If the stylus pressure is low (3 g or less) wear is reduced to a practical level. If the radius of the tip is 1 mil, a pressure of 2 g is preferable. However it has been found that the tip radius has less bearing on the permitted pressure than expected. 6 claims, no illustr. *J* *Tdb.545*

FP 1,238,428 (July 2, 1959) **Etablissements Bohin**

Device for presentation and packaging of articles such as sapphire or diamond for pickup. Dispositif de présentation et d'emballage pour articles tels che des saphirs ou diamants pour pick-up

1 claim, 2 illustr. *M* *Nfs.545|Tde.545*

HARDNESS, WEAR TESTING, AND PRECISION GAUGING

Marposs automatic size control equipment for piston grinding

Anon. *Machinery, Lond* 1961 Vol 98 (3) p 592 (Mar 15)

To provide for accurate grinding of pistons of the tapered, oval cross-section split skirt type, a special Jones & Shipman machine has been provided with control equipment supplied by Apparecchi Elettronici Marposs, Bologna, Italy. The measuring equipment is fitted with diamond-tipped styli, and with this set-up, pistons are ground to limits of ±0.0001 in., and the gauging unit is claimed to be capable of measurement to ±0.00002 inch. Similar units for other operations are also available. 1 illustr.

K *Chc Pr Wp:Ndb*

Portable hardness tester

Foundry Suppliers Ltd, 25a Cockspur St, London SW 1. *Mach Lloyd* 1961 Vol 33 (7A) p 45 (Apr 8)

The King portable hardness tester measures the Brinell hardness of parts of any size.

L *Unhcb Vfd Wghc*

Why nondestructive testing is needed

R. C. McMaster. *Metal Progr* 1961 Vol 79 (2) pp 70-75 (Feb)

3 illustr. *K* *Cy.21*

Surface finish measurement

Anon. *Tooling* 1961 Vol 15 (2) pp 73-74 (Feb)

A new version of the 'Diavite Microtester' surface finish measuring instrument has now been introduced. It now provides a meter reading which indicates either centre line average, maximum height of profile from mean centre line, or maximum depth of scratches, peak of valley and various types of tracer head are available. 1 illustr. *K* *Wgf*

Universal thread grinding machine model 5821

Anon. *Machines and Tooling* 1960 Vol 31 (11) pp 33-34 (Nov) (Original in Russian)

The grinding cycle of the machine may be fully automatic. Adjustment for different pitches of ground thread is controlled by variable gears. A profile microscope controls thread shapes on the grinding wheel and work to be ground. Detailed specifications are given. 1 illustr. *L* *Chcp Pr Wcm*

[Talysurf 105 surface measuring instrument]

Anon. *Metalworking Prod* 1961 Vol 105 (16) p 16 (Apr)

An industrial diamond, it is said, provides a hard wearing and sensitive stylus in the Talysurf 105 surface measuring instrument. The device, it is claimed, is capable of giving readings at points up to 11 in. inside bores having diameters down to 0.25 inch. It provides CLA readings with 0.3 in. cut off, and four measuring ranges, 0-6, 0-20, 0-60, 0-200 micro-in. CLA are provided. For maximum sensitivity on fine surfaces, the diamond is ground to between 0.00014 and 0.0002 in. radius, thus conforming closely to both British standard 1124 : 1950 and American standard B46 : 1955. 1 illustr. *X* *F Hn|Nfs Wgf*

Twist drill grinding machine. Spiralbohrerschleifmaschine

Anon. *Industr Anzeig* 1961 Vol 83 (33) p 84 (Apr) (In German)

When the machine is to be set, the drilling point is pressed against a transparent sapphire plate, behind which there are small bulbs to illuminate the point. The picture is projected on to a ground glass plate in front of the operator, who can then more easily obtain the correct positioning of the drill. 2 illustr.

A *Albz Chc Pr*

1961 Engineering & Welding Exhibition : Test equipment

W & T Avery, Ltd. *Metalworking Prod* 1961 Vol 105 (17) p 75 (Apr 26)

The equipment reviewed includes a W. & T. Avery, Ltd. visual hardness testing machine with dual microscope for 70 X and 250 X magnification, latest development for Vickers and pyramid tests. 1 illustr.

A *Unhcc Vfd Wc*

Portable hardess tester

J. O. Deakin & Co Ltd, Tavistock, Devon. *Instrum Pract* 1961 Vol 15 (3) p 326 (Mar)

The hardness tester weighs 3 lb, and embraces all recognised hardness value scales, *ie* VPN, Brinell and Rockwell C. The action of the tester, using a diamond indenter which penetrates to a maximum of 0.005 in., is described. *L* *Nd Wghc*

Modern instruments for hardness testing. Neuzeitliche Geräte für die Härteprüfung

E. Forstner. *Industr-Anzeig* 1961 Vol 83 (33) pp 71-75 (Apr) (In German)

Discusses various methods of hardness testing and the construction and principles of a number of testers, including the Rockwell, Brinell and Vickers instruments. Diamond is used in most of them.

A *Nd Wghc*

Apparatus for hardness testing at low temperatures

L. L. France, R. T. Begley, H. Kohute. *Mater Res Stand* Vol 1 (3) pp 192-194 (Mar)

Tests were carried out on recrystallised electron-beam melted columbium in the temperature range from 20 to -196° Centigrade. The apparatus, constructed to overcome the disadvantages usually encountered with the use of low-temperature liquid baths, is described. The Vickers hardness tester used has an extended diamond 136° pyramid indenter. 5 illustr, 11 ref.
L *Cvd Nde Vbc Wghc*

Co-ordinate-boring machine model LP-97

Sverdlov Machine Building Factory, Leningrad. *Machines and Tooling* 1960 Vol 31 (11) pp 34-35 (Nov)

The machine is designed for vertical and horizontal precision boring. Holes can be drilled, broached and reamed, and surfaces may be faced-up. There are two spindle heads with adjustable nitrided quills on which spindles are fitted. Optical devices are fitted for precision measurements. Detailed specifications are given. 1 illustr. *L* *Cfdb Pr Wc*

New instrument grades polished metal surfaces

W. H. Tingle, F. R. Potter. *Prod Engng* 1961 Vol 32 (13) pp 52-53 (Mar 27)

The DORI (Distinctness of Reflected Image) meter produces quantitative readings of the quality of polished surfaces by means of a photo-cell device which reacts to the reflection of light from the surface under test. 4 illustr. *W* *Bf Chm Unf.2552:W*

USP 2,942,458 (Oct 17, 1956) **G. A. Kerr**

Hardness tester

This is a Brinell tester utilizing a steel ball in which the force for producing the indentation of the sample is created by a measured quantity of powder in an explosive cartridge. 1 claim, 3 illustr. Ref cited: 5 USP; 1 GP; see also USP 2,470,117; 2,645,772 (for guns). *J* *Wgh.545*

FP 1,224,464 (May 13, 1958—conv date, Italy) **A. Ernst**

Hardness measuring apparatus, especially for metals. Appareil pour la mesure de la dureté, spécialement pour métaux

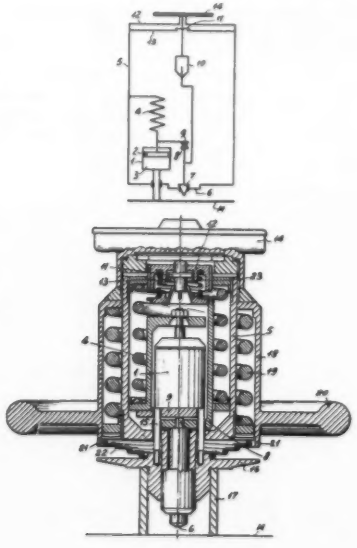


Fig 3 (above) and 4 (below). FP 1,224,464.

The hardness tester operates as shown in Fig 3. Calibrated spring 4 transfers the load through faces 8, 9 onto point 7 disk 11 abutting against shoulder 13. Housing 5 is then pushed down on sample M causing compression of spring 4 while the preload is not altered. Then spring 4 slowly pushes back the piston in cylinder 1 and thus gradually increases the load on point 7. Fig 4 is a cross section through the apparatus, the hardness being indicated on dial 14. 10 claims, 2 illustr. *J* *Bf Cvd Wgh.545*

TRUING OF GRINDING WHEELS

Truing device for grinding wheels for form grinding. Abrichtvorrichtung für Schleifscheiben zum Formschleifen

Anon. *Fertigungstechnik, Berl* 1961 Vol 11 (4) p 280 (Apr) (In German)

The wheel is trued to the required form with a diamond, using a tracing device. 2 illustr.
A *Ab Cgh Nj Psf*

Grinding internal grooves of semi-elliptical cross-section

Anon. *Mach Shop Mag* 1961 Vol 22 (4) pp 204-205 (Apr)

An Orcutt 20 spline grinding machine has been converted for grinding longitudinal grooves in a component for a constant velocity universal joint. The wheel profiling device generates the desired wheel form quite simply; it is maintained on the table and so is always in the correct position. The diamond is swung through a simple circular arc, but by the relative disposition of the diamond and grinding wheel, a substantially semi-elliptical form is generated on the wheel periphery. 2 illustr.
E *Chcn Pr Psf:Njb*

Diamond wheel dresser. Particles cemented in metal matrix

Canadian Koebel Diamond Tool Co. *Canad Mach* 1961 Vol 72 (4) p 140 (Apr)

The tool consists of uniformly distributed diamond particles in a metal bond, and as the matrix wears, fresh sharp diamond-cutting edges are continually exposed. Considerable reductions in costs, as compared with the use of single-diamond turning tools, are claimed. 1 illustr. *L* *Nje*

The Hungarian engineering industry serves technical progress

Z. Ede. *Machines and Tooling* 1960 Vol 31 (11) pp 5-9 (Nov) (Original in Russian)

Various lathes and grinding machines are described. The model KKU-250 grinder is claimed to ensure sufficient accuracy with high production. Work is being done to establish automatic dressing of the wheels. On the centreless model KCH-63 grinding machine, the grinding wheel is dressed hydraulically. 10 illustr.
L *Chc Pr Psf.329*

Michigan tool automatic grinder for processing external crown and spur gears

Gear Grinding Div, Michigan Tool Co. *Machinery, NY* 1961 Vol 67 (7) pp 146-147 (Mar)

On this machine form templates are used with the hydraulically controlled diamond trimmer to trim wheels in preparation for grinding gears with diametrical pitcher within a range of from 64 to 4. 1 illustr. *A* *Ab Cgz Nj Psfbz*

Wheel dresser

Lazzara Co, 112 Meyerland Plaza, Houston 35, Texas. *Purchasing Week* 1961 Vol 4 (11) p 38 (Mar 13)

Diamond wheel dresser, with ¼ in. × ⅛ in. face, has alternate layers of 21 and 22 diamonds for dressing of wheels from 12 in. to 48 in. in diameter. It may be used on dry and wet grinding machines and is guaranteed to outwear a 2 ct diamond wheel dresser. 1 illustr. *K Njd*

Microhardness and other properties of magnesium (intermetallic) compounds with the calcium fluoride structure

E. R. Petty. *Nature* 1961 Vol 189 pp 132-133 (Jan); *Bull Brit non-ferr Met Ass* 1961 Vol 41 (380) p 140 (Mar)

Microhardness tests were made by a diamond indenter under 50 g load. *X Cvdb Nd*

Hardness : theory and practice. Part I—Practice

L. Small. *Book* 1960 549 pp. Service Diamond Tool Co, Ferndale, Mich, USA; *Bull Brit non-ferr Met Ass* 1961 Vol 41 (380) p 136 (Mar)

A comprehensive review of the art of hardness testing. The construction and operation of Brinell, Rockwell and Vickers hardness machines are described. *X Cvd Wghc.21*

Atomized liquids for surface grinding coolants

D. N. Troitskaya, V. N. Shavoronkov. *Machines and Tooling* 1960 Vol 31 (10) pp 34-37 (Oct) (Original in Russian)

Experiments were conducted using ceramic bonded grinding wheels which were diamond trued before each experiment. 7 illustr. *L Ab Bl Cg Nj*

New method for the truing of grinding wheels. Nuovi metodi per la ravvivatura della mole

C. L. Whitaker. *Ingegneria* 1961 Vol 11 (4) pp 443-447 (Apr) (In Italian)

The advantages and disadvantages of single and multiple diamond truing tools are compared and discussed. 7 illustr. *M Njb*Njd*

USP 2,944,373 (Mar 3, 1958) **M. B. Mentley, Z. Kokorzyeki, D. W. Daniel, National Broach & Machine Co**

Grinder with compensating trimming mechanism

The grinding wheel support and the truing device are moved by a compound screw so that if the wheel when needing truing is fed a certain amount by turning a hand wheel, the truing device is moved simultaneously relatively to the wheel and thus positioned to remove from the periphery of the wheel an amount of stock exactly equal to the amount by which the wheel was fed. Adjustment nuts are provided on different portions of the compound screw having threads of opposite hand. 6 claims, 4 illustr. Ref cited : 4 USP.
J Chcp Pe Pr.545

USP 2,947,302 (Jan 10, 1958) **H. B. Patterson, Bryant Chucking Grinder Co**

Art of dressing grinding wheels

Normal diamond truing produces a more or less coarse helix on the wheel leaving a random scatter of grits projecting above the true surface generated by the diamond point causing poor finish. It has therefore been suggested to dull the cutting face by mechanical means which, however, is a very delicate operation and quite unsuitable in an automatic machine. Instead of removal of the projecting grits by mechanical means the new method uses a chemical reaction. It has been found that among other materials commercial titanium *eg* a titanium base alloy 150 of the Titanium Metals Corp has the desired effect. An arrangement for using the method is shown in Fig 5 and 6 where block 2 containing the treating material is held by spring 4 with adjustable pressure against wheel 14 after this was trued by diamond 16. Fig 6 is a magnified schematic picture showing the effect of the treatment. 3 claims, 4 illustr. Ref cited : 4 USP.
J Ab Cg.1456.545

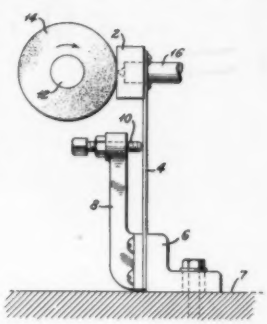
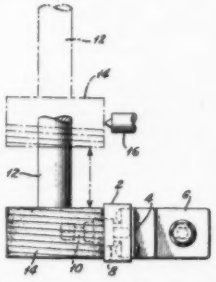


Fig 5 (above) and 6 (below). USP 2,947,302.



DAS 1,084,165 (Feb 6, 1958) **Wernicke & Co KG**

Truing device for grinding wheels, in particular for facet grinding machines for spectacle lenses. Abrichtvorrichtung für Schleifscheiben, insbesondere an Facetteschleifmaschinen für Brillengläser

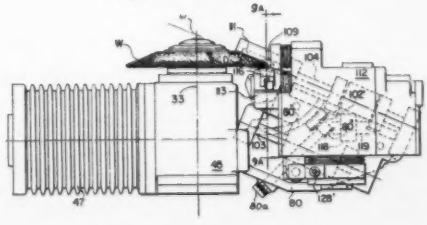
The part carrying the adjustable truing tool is movable by a nut resiliently guided along a template. 5 claims, 3 illustr. Ref cited : 1 GP ; 1 BP ; 2 USP.
J Bm Chc Pr Psf.545

DAS 1,086,111 **L. O. Carlsen, W. C. Critchley, H. Pedersen, Gleason Works**
(Sep 7, 1954—conv date, USA)

Grinding machine for toothed machine elements with truing device for the conical grinding wheel. Schleifmaschine für verzahnte Maschinenelemente mit Abrichtvorrichtung der kegelförmigen Schleifscheibe

The grinding head is slidable approximately in a straight line, in known manner, in the direction of a line in the surface of the conical grinding wheel through its apex. The truing device is mounted on an auxiliary frame and is slidable approximately in the direction of another line in the surface of the grinding wheel and this movement takes place in a certain ratio to the movement of the grinding wheel. The machine has two grinding wheels and two truing devices symmetrically arranged to each other. The diamond D as shown in Fig 7 and 8 is carried by a holder 80 with a curved slideway 80'. 102 is an auxiliary frame with a slide 105.

Fig 7. DAS 1,086,111.



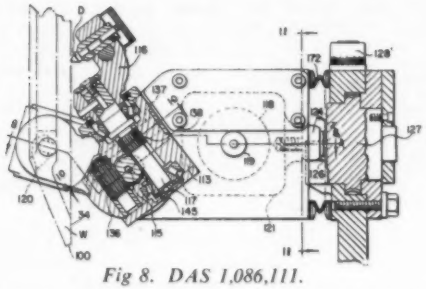


Fig 8. DAS 1,086,111.

Each truing device is adapted to true the straight and the curved profile portions of wheels W. 12 claims, 14 illustr. Ref cited : 1 GP.

J *Ad Chc Pr Psf.545*

FP 1,224,481 **Gear Grinding Co**

(May 13, 1958 ; Apr 9, 1959—conv date, Gt Britain)

Mechanism for truing grinding wheels for gear grinding machines. Mécanisme pour reprofiler les meules de rectification des engrenages

The mechanism is designed for truing profiles defined by a straight line blending into curved portions. As shown in Fig 9 and 10 the mechanism is mounted on a base 6 with two upstanding side walls 7. A carriage 11 reciprocates between stops 8 in these walls. Carriage 11 contains transverse spindle 13 with bracket 15 and diamond tool 16, 17. Spindle 13 is held against rotation

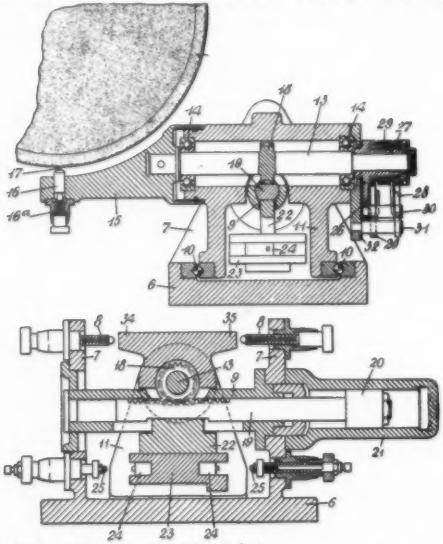
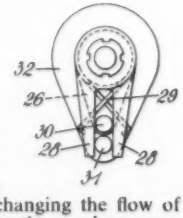


Fig 9 (top), 10, and 11 (right). FP 1,224,481.

by spring 29, Fig 11, so that fluid pressure on piston 20 will reciprocate carriage 11 until it is arrested by one of the stops 8 whereupon further pressure causes a turning movement of spindle 13 through rack and pinion 18, 19 until contacts 24, 25 close an electric circuit to actuate a valve changing the flow of fluid in cylinder 21 and thus reverse the turning movement and the direction of carriage 11. 3 claims, 5 illustr.



J *Abmd Cgf Psf.545*

PRECISION MACHINING OF METALS

Metal working techniques. Metall Zerteilung und —Abarbeitung

Anon. *Dtsch Goldschmiede Ztg* 1961 Vol 59 (3) pp 144-146 (Mar) (In German)

A discussion from the goldsmith's point of view of a number of processes used in fine metal working. These include shaving and filing, milling, which may use aluminium oxide, turning, polishing with emery or tripoli, and the use of chemical solutions.

A *Bf Ceq.1456.21*

Drilling and reaming beryllium

Anon. *Metalworking Prod* 1961 Vol 105 (4) pp 52-53 (Apr)

Because of its hardness and tendency to seize, beryllium presents special problems in drilling. Solid carbide or carbide-tipped tools are said to be best ; but drill geometry has to be modified, too. This article tells of proven techniques not only for conventional hole drilling, but also for deep-hole and gun-drilling operations.

X *Bfu Cel.1456/Bfu Cfb.1456*

Machine tools and equipment

Anon. *Times Rev Ind* 1961 p 92 (Apr)

The latest Emicon tape system includes a newly developed arrangement for continuously checking the punched tape while the machine tool is in operation. Thus the machine is stopped if an error is detected, which prevents the production of spoilt work. The application of the Emicon system to a profile milling machine, is described. 1 illustr.

L *Pr Wpb*

Cutting machine has oscillating action

Beaver Pipe Tools Inc, Warren, Ohio. *Purchasing Week* 1961 Vol 4 (11) p 36 (Mar 13)

The wheel of this abrasive cutting machine operates with a backward and forward motion, cuts up to 4 in. solids and most 6 in. forms at speeds of three to four sec/sq inch. An air-operated cutting head is available for heavy-duty applications. 1 illustr.

K *Ceg Pe Pr Qnj*

Taper turning lathe

Crossley Bros Ltd, Manchester 11. *Mach Lloyd* 1961 Vol 33 (6) p 59 (Mar 18)

The Crossley-Beer double ended taper turning lathe is provided with boring tools on one tool post and turning tools on the other. It is designed for machining identical tapers on mating conical components such as valve bodies and valve plugs of taper valve cocks. 1 illustr.

L *Ceqb Pr*

We use fly cutters !

P. G. Lynch, Hewlett-Packard Co, Palo Alto, California, USA. *Cutting tool Engng* 1961 Vol 3 (3) pp 16-19 (Mar)

Precision final milling of aluminium is done with the New-Field Universal Fly Cutter, where close tolerances and high quality finish are especially important in the manufacture of microwave equipment. 5 illustr.

E *Bfg Cffg Pd*

Origin and effect of radial forces in drilling with twist drills. Entstehung und Wirkung von Radialkräften beim Bohren mit Spiralbohrern

G. Pahlitzsch. *Werkstattstechnik* 1961 Vol 51 (5) pp 227-234 (May) (In German)

19 illustr, 7 ref.

A *Cfb Plz*

Cutting plates for transformer cores

Ferranti, Ltd, Hollinwood, Lancs. *Metallurgia* 1961 Vol 63 (377) pp 140-141 (Mar)

The new, fully automatic core plate cutting machine combines in one operation the piercing of all holes or slots and the cutting of two plates/cycle of the machine. Edge grinding to remove burrs is also provided for. The degree of accuracy is said to be greater than by any previous machine. The machine and its applications are described. 2 illustr, 1 table.

L *Az Ceg Pr/Az Chz Pr*

Smooth-surfacing of light metals by the use of diamond tools

P. Frey. *Alumin Suisse* 1960 Vol 10 (6) pp 287-289 (Nov) (In French and German); *Bull Brit non-ferr Met Ass* 1961 Vol 41 (380) p 143 (Mar)

High surface qualities, exact dimensions and saving in cost are achieved by use of diamond machine tools in finishing light metals. Conditions to be observed in the constructions and use of diamond tools for this purpose are indicated and several types of tool described.

X *Bfv Chm Nf Unf*

High speed machine tool attachments for small batch production

M. G. Girshovich. *Machines and Tooling* 1960 Vol 31 (10) pp 37-39 (Oct) (Original in Russian)

High speed loading lathe and turret chucks, machine and bench vices, and high speed indexing devices are used to save time taken in clamping and unclamping components during machining. 4 illustr.

L *Pr Psc*

Why not broach it ?

J. A. Psenka, National Broach & Machine Co, Detroit, Michigan, USA. *Cutting tool Engng* 1961 Vol 3 (3) pp 8-15 (Mar)

Amongst advantages claimed for broaching are high production, low operator skill, low cost per piece, and high quality of finish. The article deals with many applications of broaching, which can be used on steel up to 42 Rockwell C. 9 illustr.

E *Bfcb Cfm.21*

Fundamentals of economic manufacture—21

W. F. Walker. *Tooling* 1961 Vol 15 (2) pp 33-36 (Feb)

Characteristics and capabilities of vertical boring mills are described. With the aid of extra attachments various turning operations, including taper generating, spherical turning and profile turning, can be carried out. 3 illustr.

K *Cfd Pr Psc*

Buma coupling boring machine

Buma Engineering Co Ltd, Robson St, Newcastle-upon-Tyne, 6. *Machinery, Lond* 1961 Vol 98 (2527) p 882 (Apr 19)

A new design of portable machine is described for fine boring the driving bolt holes in coupling flanges *in situ*. A special micrometer is supplied for setting the cutting size of the tungsten-carbide tipped cutter, which is sharpened on a built-in metal-bonded diamond wheel. 1 illustr.

E *Al Bkcb Chc Nv Wbd/Cfdb Pr Wbd*

USP 2,942,383 (Oct 17, 1957) **G. C. Brown, R. N. Roney, Sheffield Corp**

Machine device

Feed control is of greatest importance when drilling extremely hard material utilizing high frequency oscillations of delicate tools with minute amplitudes under flooding with liquid abrasive. Such machines operate usually in the ultrasonic range. A predetermined maximum feed rate is provided for optimum operation. Should the actual feed rate drop below this reference rate the tool is automatically retracted for a given time to allow full flooding of the working area before restoring the reference rate of feed. The control is effected by a beam, control rod and plunger device actuating switches when the feed movement of the drill does not coincide with the movement of the control device. 13 claims, 7 illustr. Ref cited : 2 USP ; 1 Russian P ; 1 BP. See also USP 2,791,166 (machine).

J *Ba Ceq Qnj:Psc.545*

CUTTING AND MACHINING OF STONE, GLASS, ETC.

Glass drilling and cutting. Method and apparatus for drilling large holes through glass sheets

Anon. *Diaco Dig* 1960 Vol 4 p 5 (Aug)

The problem of overcoming high coolant pressures in tubular drills has been overcome by reducing the air pressure inside the drill after placing it against the glass to be drilled, and then supplying coolant outside the cutting edge. A 10 min drilling operation, using the conventional method, was done in 45 sec, using a diamond drill in the new manner.

W *Bm Cfb Nh*

FP 1,224,927 **Wernicke & Co KG**

(Feb 7, 1958—conv date, Germany)

Grinding machine in particular for spectacle glasses. Machine à meuler, en particulier les verres de lunettes

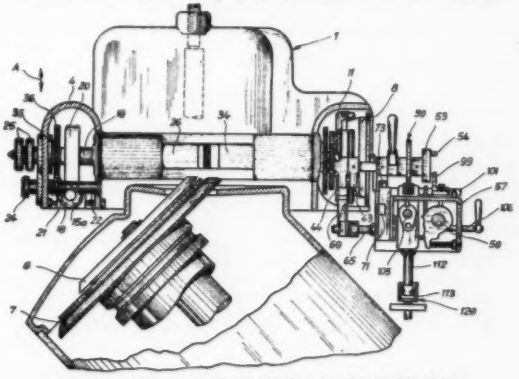
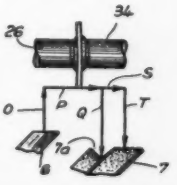


Fig 12 (above) and 13 (below). FP 1,224,927.



The characteristic feature of the machine is the direct grinding of the lens without preparation using a diamond grinding wheel and a ceramic wheel. The wheels are arranged in parallel relationship and the lens movement is template actuated by a control shaft so as to pass from one wheel to the other. Fig 12 shows the grinding wheels 6 and 7 and the shaft parts 26 and 34 between which the lens is clamped as in Fig 13. The sequence of operations is indicated by arrows in Fig 13 and the lettering O, P, Q, S, T whereby 6 is the diamond wheel and 7a the bevel producing groove in the ceramic wheel 7. 19 claims, 18 illustr.

J *Bm Chc Tfd:Pr.545*

FP 1,225,166 (Mar 7, 1959) **P.-G.-F. Camard**
Glass cutting apparatus. Appareil à couper le verre
1 claim, 2 illustr. *M* *Bm Ceg Ncb.545*

DAS 1,084,190 (May 21, 1955) **W. Fuchs, K. Frölich, Wallram Hartmetall GmbH**
Tool for stone working. Werkzeug zur Steinbearbeitung
6 claims, 3 illustr. Ref cited : 1 GP, 1 Swiss P, 1 USP.
M *Bn Ceq Pd.545*

GEM POLISHING

Instruments for identifying precious stones. Instrumente zur Bestimmung von Edelsteinen
Anon. *Gold u Silber* 1961 Vol 14 (4) pp 32-35 (Apr) (In German)
A discussion of the instruments required, giving the manufacturer and price of the most important models. The article lists the following : miscroscope, refractometer, dichroscope, polariscope, hydrostatic balance and other instruments, and concludes with a short list of recommended technical literature. 11 illustr.
A *Bb Ccb W*

Diamonds and gems as retailed around the world
A. D. Leveridge. *S Afr Jeweller* 1961 Vol 24 (4) pp 8-9 (Jan)
A tourist's impressions of jewellers' shops in different countries are given.
L *Bb.251.31/F Kb.251.31*

ROCK DRILLING

Diamonds for pro¹ect ' Mohole '
Anon. *Min J.* 1961 Vol 256 (6556) p 417 (Apr 14)
Industrial Distributors (1946) Ltd have sent about 3000 ct of diamond drill material to Washington for use in project ' Mohole '. Large solid block-like crystals, free from fragile edges that could break and pull out from the drilling bit, have been provided. Well-designed diamond crowns are essential to avoid expense and waste of time involved in withdrawing drill bits for replacement from great depths. 1 illustr.
L *Fc Nhg*

American zinc's deep drilling locates Missouri iron deposit
Anon. *World Min* 1961 Vol 14 (3) p 33 (Mar)
A major iron ore deposit has been discovered beneath the town of Bourbon, M¹ssouri, as a result of deep diamond drilling of 16 holes with an average depth of 2,690 feet. 1 illustr. *L* *Cfb Nh.12.342*

Engineers strike toward a new frontier
Anon. *Prod Engng* 1961 Vol 32 (7) pp 13, 15-17 (Feb 13)
Description of apparatus to be used in full-dress rehearsal for drilling ' Mohole '. Diamond bits will be used. 3 illustr. *W* *Bnt Cfb Nhb Pl*

' Down-the-hole ' machine cuts time and costs
Anon. *S Afr Min Engng J* 1961 p 87 (Apr 7)
The Halco Stenuick Drill is said to have cost one firm less than 1s 10d a foot drilled compared with its former average of 10s a foot, on the same type of blasthole work, but using an ordinary diamond drill. 1 table.
E *Cfb Nh*

Boart & Hard Metal Products, SA Ltd
Anon. *S Afr Min Engng J* 1961 p 95 (Apr 7)
Reviews Boart & Hard Metal Products SA Ltd, which was established early in 1956 to market tungsten carbide drill stems and diamond drill crowns, manufactured by their subsidiaries, Hard Metals Ltd, and Boart Products Mfg Co Ltd, who produce 10,000 diamond crowns/month and, in addition, grinding wheels, wheel dressers, diamond saws, and all types of precision diamond tools. 2 illustr.
E *N Qc.251.361*

Holman's have been in from the start
Anon. *S Afr Min Engng J* 1961 p 33 (Apr 7)
A review of eighty years progress in compressed air rock-drills by Holman's with particular reference to South Africa. Their latest model is the Rotair 600, Britain's first rotary screw portable compressor that, it is claimed, has doubled the output of low temperature compressed air without increase in size or weight.
E *Bn Cfbz Pl*

Twenty-seven years of diamond drilling
Anon. *S Afr Min Engng J* 1961 p 21 (Apr 7)
Holes are now being drilled up to 10,000 ft in depth and average performances of 1,300 ft/month are not uncommon. Present equipment and methods employed are discussed, as well as some possible future deve¹opments. *E* *Cfb Nh*

S.A. made diamond core drill for Canada
Anon. *S Afr Min Engng J* 1961 Vol 72 Pt 1 (3552) p 475 (Mar 3)
Falconbridge Nickle Co of Ontario, have ordered a Joy No 50 diamond core drill for drilling to depths in excess of 5,000 feet. The Joy 50, largest diamond core drill in the world, can drill a 2 in. vertical hole to a depth of 12,000 feet. *W* *Nhe*

A case history of geochemistry and prospecting in north-west Queensland
J. F. Ivanac, D. F. Branagan. *Proc Aust Inst Min Metall* 1960 No 125 pp 25-35, maps, biblio. Melbourne (Sep) : *IMM Abstracts* 1961 Vol 11 (3) p 62 (Feb-Mar)
Four areas which were diamond-drilled are described in detail. *L* *Cfb Nh.12*

Diamond drilling on Eniwetok
US Geological Survey, Professional Paper, 260-Y, 1960. US Government Printing Office, Washington, DC.
Diamond News 1961 Vol 24 (4) p 19 (Jan)
On deeper holes and harder formations where cores were required, diamond drilling was employed.
L *Cfb Nhe.12*

BP 842,190 (Dec 18, 1957) **J. B. Seed, D. K. C. Anderson, J. Robertson, Imperial Chemical Industries Ltd**
Improvements in drilling boreholes
12 claims, 6 illustr.
M *Az Cb Cfb.132.545*

DIAMOND TECHNOLOGY
First published 1942 as " Production Methods for Diamond and Gemstone." The second edition of this book by P. Grodzinski has been revised throughout and considerably enlarged. 840 pages, 486 illustrations, 94 tables, and Indexes. From NAG Press Ltd., 226 Latymer Court, London W 6. 55s 0d, post free.

WIRE DRAWING

A machine-shop for carbide dies

Belgian Tool Co, 55 Rue Leopold, Malines, Belgium. *Wire Ind* 1961 Vol 28 (328) p 378 (Apr)

The Malines Universal Complex machine is made up of three parts. The M-U 61 ten-spindle machine drills, rips, reshapes, and recuts tungsten carbide dies, whether set or unset. The ten spindles are entirely independent. The machine can pre-polish the dies with boron carbide, and the type BP-61 polishing head uses diamond paste to reach fine size in a few minutes. The TB-61 needle grinder re-sharpens needles, pins, or broaches to the required angle, and supplies the number of regrinds required to feed the fast working ten-spindle machine. 2 illustr.

L *Ax Bkcb Ceq Pr/Ax Bkcb Chm Kmg*

Cleaning fine wire drawing dies. Ultrasonic cleaning methods are applied

J. W. Cowan. *Ultrasonic News* 1960 Vol 4 (3) pp 10-15 (Fall); *Battelle Tech Rev* 1961 Vol 10 (2) p 190 (Feb) (Feb)

X *Px Qeb Vwghb*

Swiss P 346,484 Institute Dr Ing Reinhard Straumann AG (June 7, 1957)

Method for making pointed spindles for point bearings of apparatus and instruments (add 341,442). Verfahren zur Herstellung von mit Lagerspitzen versehenen Wellen für Spitzenlagerungen in Apparaten und Instrumenten

The main patent describes a method for making pointed spindles from a heated and chilled wire which is cold drawn down to obtain high strength and hardness. This method is further improved by subjecting the front portion of the point to a shaping operation

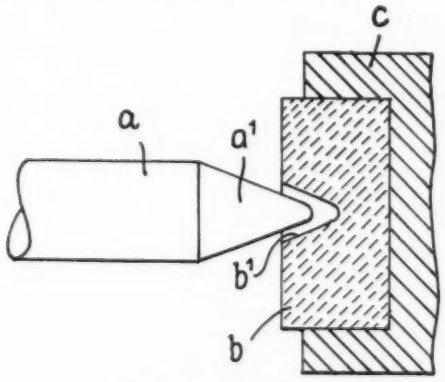


Fig 14. Swiss P 346,484.

in a die as illustrated in Fig 14. Spindle a may be clamped in the chuck of a drilling machine and point a¹ pressed into recess b¹ in die b. The material of the die should be harder than the point and the recess polished. The die may thus be sapphire, ruby, or diamond. 4 claims, 1 illustr.

J *Psz W.545*

LITERATURE REQUESTS
When applying for the loan of literature abstracted in this journal, please quote the title of the article, the name of the author, and the number of the page on which it appeared.

GRINDING AND POLISHING OF CARBIDES AND METALS

Grinders — Lapping — Grinding. Schleifmaschinen/Läppen/Schleifen

Anon. *Industrieblatt* 1961 Vol 61 (3) pp 187-189

Includes a description of a cam shaft grinder, using a profile tracing device, and a centreless cylindrical grinder, the latest model in the Multimat series, in which an even pressure is maintained by the tracing point, and this is claimed to ensure high precision in profiling. A hydraulic tool sharpening and grinding machine has a hydraulically controlled diamond truing device. A grinding and lapping machine for working tools mounted with sintered carbide, uses diamond grinding wheels, and has the firm construction and vibration-free grinding spindle needed for the use of these wheels

A *Chc Nv Pr/Chc Pr Psfb:Nj*

Modern automatic machine tools : Grinders. Neuzeitliche automatische Werkzeugmaschinen : Schleifmaschinen

Anon. *Technik u Betrieb* 1961 Vol 13 (4) pp 57-58 (Apr) (In German)

Refers to Italian machines on which diamond wheels are used for grinding the smallest bores, and ceramic wheels for large diameters.

A *Chc Nv Pr.3225/Chc Pe Rp:Pr.3225*

Shaft polisher-buffer. Automatic for various diameters

Acme Mfg Co, Detroit, USA. *Canad Mach* 1961 Vol 72 (4) p 137 (Apr)

This lathe-type machine provides for automatic polishing and buffing of shafts and rolls of up to 32 in. diameter and 72 in. long. A 2-micro-in. surface finish can be obtained. 1 illustr.

L *Ag Chm Prs/Ag Chhj Prs*

Grinding. $13,000 diamond-grinding wheels

Anon. *Diaco Dig* 1960 Vol 4 p 5 (Aug)

A 6 in. wide diamond grinding wheel—cost $13,000—has paid for itself within a year through faster production, better quality finish, and reduced scrap. The wheel was used in the production of microwave electronic tubes.

W *Nv*

Tooling and machining the Hoover Keymatic

Anon. *Tooling* 1961 Vol 15 (4) pp 35-41, 61 (Apr)

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K *Chcc Pr*

Conforming polishing wheel

Anon. *Metalworking Prod* 1961 Vol 105 (12) p 16 (Mar 22)

An open network of nylon fibres have tiny globules of resin-abrasive mix attached to them, compressed to form ¼ in. thick disks. Any number of disks with diameters up to 14 in. can be joined together on a spindle to form a wheel that can conform to work shape with ease, giving a finish that is unique in appearance due to a burnishing action. 1 illustr.

L *Chm Pe Urb*

FP 1,225,166 (Mar 7, 1959) **P.-G.-F. Camard**
Glass cutting apparatus. Appareil à couper le verre
1 claim, 2 illustr. *M* *Bm Ceg Ncb.545*

DAS 1,084,190 (May 21, 1955) **W. Fuchs, K. Frölich, Wallram Hartmetall GmbH**
Tool for stone working. Werkzeug zur Steinbearbeitung
6 claims, 3 illustr. Ref cited : 1 GP, 1 Swiss P, 1 USP.
M *Bn Ceq Pd.545*

GEM POLISHING

Instruments for identifying precious stones. Instrumente zur Bestimmung von Edelsteinen
Anon. *Gold u Silber* 1961 Vol 14 (4) pp 32-35 (Apr) (In German)
A discussion of the instruments required, giving the manufacturer and price of the most important models. The article lists the following : miscroscope, refractometer, dichroscope, polariscope, hydrostatic balance and other instruments, and concludes with a short list of recommended technical literature. 11 illustr.
A *Bb Ccb W*

Diamonds and gems as retailed around the world
A. D. Leveridge. *S Afr Jeweller* 1961 Vol 24 (4) pp 8-9 (Jan)
A tourist's impressions of jewellers' shops in different countries are given.
L *Bb.251.31/F Kb.251.31*

ROCK DRILLING

Diamonds for pro¹ect ' Mohole '
Anon. *Min J.* 1961 Vol 256 (6556) p 417 (Apr 14)
Industrial Distributors (1946) Ltd have sent about 3000 ct of diamond drill material to Washington for use in project ' Mohole '. Large solid block-like crystals, free from fragile edges that could break and pull out from the drilling bit, have been provided. Well-designed diamond crowns are essential to avoid expense and waste of time involved in withdrawing drill bits for replacement from great depths. 1 illustr.
L *Fc Nhg*

American zinc's deep drilling locates Missouri iron deposit
Anon. *World Min* 1961 Vol 14 (3) p 33 (Mar)
A major iron ore deposit has been discovered beneath the town of Bourbon, M¹ssouri, as a result of deep diamond drilling of 16 holes with an average depth of 2,690 feet. 1 illustr. *L* *Cfb Nh.12.342*

Engineers strike toward a new frontier
Anon. *Prod Engng* 1961 Vol 32 (7) pp 13, 15-17 (Feb 13)
Description of apparatus to be used in full-dress rehearsal for drilling ' Mohole '. Diamond bits will be used. 3 illustr. *W* *Bnt Cfb Nhb Pl*

' Down-the-hole ' machine cuts time and costs
Anon. *S Afr Min Engng J* 1961 p 87 (Apr 7)
The Halco Stenuick Drill is said to have cost one firm less than 1s 10d a foot drilled compared with its former average of 10s a foot, on the same type of blasthole work, but using an ordinary diamond drill. 1 table.
E *Cfb Nh*

Boart & Hard Metal Products, SA Ltd
Anon. *S Afr Min Engng J* 1961 p 95 (Apr 7)
Reviews Boart & Hard Metal Products SA Ltd, which was established early in 1956 to market tungsten carbide drill stems and diamond drill crowns, manufactured by their subsidiaries, Hard Metals Ltd, and Boart Products Mfg Co Ltd, who produce 10,000 diamond crowns/month and, in addition, grinding wheels, wheel dressers, diamond saws, and all types of precision diamond tools. 2 illustr.
E *N Qc.251.361*

Holman's have been in from the start
Anon. *S Afr Min Engng J* 1961 p 33 (Apr 7)
A review of eighty years progress in compressed air rock-drills by Holman's with particular reference to South Africa. Their latest model is the Rotair 600, Britain's first rotary screw portable compressor that, it is claimed, has doubled the output of low temperature compressed air without increase in size or weight.
E *Bn Cfbz Pl*

Twenty-seven years of diamond drilling
Anon. *S Afr Min Engng J* 1961 p 21 (Apr 7)
Holes are now being drilled up to 10,000 ft in depth and average performances of 1,300 ft/month are not uncommon. Present equipment and methods employed are discussed, as well as some possible future deve¹opments. *E* *Cfb Nh*

S.A. made diamond core drill for Canada
Anon. *S Afr Min Engng J* 1961 Vol 72 Pt 1 (3552) p 475 (Mar 3)
Falconbridge Nickle Co of Ontario, have ordered a Joy No 50 diamond core drill for drilling to depths in excess of 5,000 feet. The Joy 50, largest diamond core drill in the world, can drill a 2 in. vertical hole to a depth of 12,000 feet. *W* *Nhe*

A case history of geochemistry and prospecting in north-west Queensland
J. F. Ivanac, D. F. Branagan. *Proc Aust Inst Min Metall* 1960 No 125 pp 25-35, maps, biblio. Melbourne (Sep) : *IMM Abstracts* 1961 Vol 11 (3) p 62 (Feb-Mar)
Four areas which were diamond-drilled are described in detail. *L* *Cfb Nh.12*

Diamond drilling on Eniwetok
US Geological Survey, Professional Paper, 260-Y, 1960, US Government Printing Office, Washington, DC. *Diamond News* 1961 Vol 24 (4) p 19 (Jan)
On deeper holes and harder formations where cores were required, diamond drilling was employed.
L *Cfb Nhe.12*

BP 842,190 (Dec 18, 1957) **J. B. Seed, D. K. C. Anderson, J. Robertson, Imperial Chemical Industries Ltd**
Improvements in drilling boreholes
12 claims, 6 illustr.
M *Az Cb Cfb.132.545*

DIAMOND TECHNOLOGY
First published 1942 as " Production Methods for Diamond and Gemstone." The second edition of this book by P. Grodzinski has been revised throughout and considerably enlarged. 840 pages, 486 illustrations, 94 tables, and indexes. From NAG Press Ltd., 226 Latymer Court, London W 6. 55s 0d, post free.

WIRE DRAWING

A machine-shop for carbide dies

Belgian Tool Co, 55 Rue Leopold, Malines, Belgium. *Wire Ind* 1961 Vol 28 (328) p 378 (Apr)

The Malines Universal Complex machine is made up of three parts. The M-U 61 ten-spindle machine drills, rips, reshapes, and recuts tungsten carbide dies, whether set or unset. The ten spindles are entirely independent. The machine can pre-polish the dies with boron carbide, and the type BP-61 polishing head uses diamond paste to reach fine size in a few minutes. The TB-61 needle grinder re-sharpens needles, pins, or broaches to the required angle, and supplies the number of regrinds required to feed the fast working ten-spindle machine. 2 illustr.

L *Ax Bkcb Ceq Pr/Ax Bkcb Chm Kmg*

Cleaning fine wire drawing dies. Ultrasonic cleaning methods are applied

J. W. Cowan. *Ultrasonic News* 1960 Vol 4 (3) pp 10-15 (Fall); *Battelle Tech Rev* 1961 Vol 10 (2) p 190 (Feb) (Feb)

X *Px Qeb Vwghb*

Swiss P 346,484 Institute Dr Ing Reinhard Straumann AG (June 7, 1957)

Method for making pointed spindles for point bearings of apparatus and instruments (add 341,442). Verfahren zur Herstellung von mit Lagerspitzen versehenen Wellen für Spitzenlagerungen in Apparaten und Instrumenten

The main patent describes a method for making pointed spindles from a heated and chilled wire which is cold drawn down to obtain high strength and hardness. This method is further improved by subjecting the front portion of the point to a shaping operation

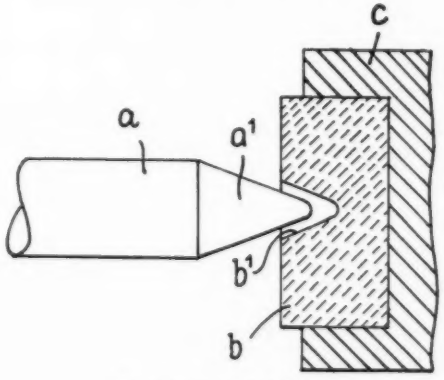

Fig 14. Swiss P 346,484.

in a die as illustrated in Fig 14. Spindle a may be clamped in the chuck of a drilling machine and point a¹ pressed into recess b¹ in die b. The material of the die should be harder than the point and the recess polished. The die may thus be sapphire, ruby, or diamond. 4 claims, 1 illustr.

J *Psz W.545*

LITERATURE REQUESTS
When applying for the loan of literature abstracted in this journal, please quote the title of the article, the name of the author, and the number of the page on which it appeared.

GRINDING AND POLISHING OF CARBIDES AND METALS

Grinders — Lapping — Grinding. Schleifmaschinen/Läppen/Schleifen

Anon. *Industrieblatt* 1961 Vol 61 (3) pp 187-189

Includes a description of a cam shaft grinder, using a profile tracing device, and a centreless cylindrical grinder, the latest model in the Multimat series, in which an even pressure is maintained by the tracing point, and this is claimed to ensure high precision in profiling. A hydraulic tool sharpening and grinding machine has a hydraulically controlled diamond truing device. A grinding and lapping machine for working tools mounted with sintered carbide, uses diamond grinding wheels, and has the firm construction and vibration-free grinding spindle needed for the use of these wheels

A *Chc Nv Pr/Chc Pr Psfb:Nj*

Modern automatic machine tools : Grinders. Neuzeitliche automatische Werkzeugmaschinen : Schleifmaschinen

Anon. *Technik u Betrieb* 1961 Vol 13 (4) pp 57-58 (Apr) (In German)

Refers to Italian machines on which diamond wheels are used for grinding the smallest bores, and ceramic wheels for large diameters.

A *Chc Nv Pr.3225/Chc Pe Rp:Pr.3225*

Shaft polisher-buffer. Automatic for various diameters

Acme Mfg Co, Detroit, USA. *Canad Mach* 1961 Vol 72 (4) p 137 (Apr)

This lathe-type machine provides for automatic polishing and buffing of shafts and rolls of up to 32 in. diameter and 72 in. long. A 2-micro-in. surface finish can be obtained. 1 illustr.

L *Ag Chm Prs/Ag Chhj Prs*

Grinding. $13,000 diamond-grinding wheels

Anon. *Diaco Dig* 1960 Vol 4 p 5 (Aug)

A 6 in. wide diamond grinding wheel—cost $13,000—has paid for itself within a year through faster production, better quality finish, and reduced scrap. The wheel was used in the production of microwave electronic tubes. *W* *Nv*

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Conforming polishing wheel

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L *Chm Pe Urb*

Western Metal Congress, Los Angeles, March 20-24

Anon. *Grinding & Finishing* 1961 Vol 7 (3) p 75 (Mar)

Exhibits at the 12th Western Metal Congress and Exhibition, Los Angeles, Mar 20-24, included Norton diamond wheels for the electronic industry. The wheels, primarily for slicing and dicing crystals, are as small as 1 in. diameter × 0.004 in. thick.

W *Bd Cej Nv*

Hard chromium plating of piston rods : preparation and finishing

Atlas Printing Works, Ltd. *Machinery* 1960 Vol 97 pp 1466-1467 ; *Bull Brit non-ferr Met Ass* 1961 Vol 41 (380) (Mar)

Treatment of piston rods for compressed air and hydraulic equipment. Polishing on a centreless polishing machine, degreasing, hard Cr plating at 0.005 in/h, finishing on centreless machine. Finishes of 5-10 microinches can be obtained.

X *Agg Chm Pr/Agg Chpb*

Precision cylindrical grinding machine. Präzisions-Rundschleifmaschine

Anon. *Industr Anzeig* 1961 Vol 83 (27) p 449 (Apr 4) (In German)

Special attention is drawn to the powerful head and tailstock, the large diameter of the grinding wheel and the hydraulic control. Additional equipment includes an internal grinding device, truing, and measuring devices. 1 illustr.

A *Chcl Pr Psf*

Roll grinder. Walzenschleifmaschine

Anon. *Industr Anzeig* 1961 Vol 83 (27) pp 448-449 (Apr 4) (In German)

This machine incorporates a recently developed infeed device claimed to maintain a consistent grinding performance despite wheel wear, and to shorten grinding time. 1 illustr.

A *Ag Chc Pr Psc*

Edge preservation during metallographic polishing

J. T. N. Atkinson, C. S. Godden. *Metallurgia* 1961 Vol 63 (377) pp 151-152 (Mar)

Polishing with diamond abrasive, followed possibly by magnesium oxide, best preserves the flatness of metallurgical specimens, but even here, slight rounding of sample edges occurs. To prevent this, a technique of mounting the specimens, using metal flake fillers in the plastic, is described. 3 illustr.

L *Bfa Chm Km/Bfa Chm.1456*

70% increase in efficiency results from wheel evaluation

R. F. Deane. *Grinding & Finishing* 1961 Vol 7 (3) p 41 (Mar)

Wheel evaluation tests were performed to select the best wheel for grinding the surface of tungsten carbide die blocks on a vertical spindle surface grinder. The wheels evaluated were a MD100-R50-BD¼ synthetic diamond and a D100-R50-BD¼ natural diamond. The synthetic diamond wheel had a 17% more efficient cutting rate and a 70% more efficient wheel life. 1 illustr.

W *Ax Bkcb Chcm Nv*Ax Bkcb Chcm Nvh*

Automation of cylindrical grinding processes

I. E. Fragin. *Machines and Tooling* 1960 Vol 31 (11) pp 9-12 (Nov) (Original in Russian)

Automation of the grinding cycle reduces grinding time. The article discusses one possible method of automating the work cycle of cylindrical grinding machines. 5 illustr, 2 ref.

L *Chcl Pr.133*

Mechanical polishing

A. Burkart, H. Silman, C. R. Draper. *Book* 1960 267 pp Robert Draper Ltd, Teddington, Middx ; *Bull Brit non-ferr Met Ass* 1961 Vol 41 (380) p 142 (Mar)

General principles, abrasives, wheels, machines, media, methods, polishing of individual metals and non-metals.

X *Chm.21*

Portable finish-boring machine for coupling flanges

Buma Engng Co Ltd, Newcastle-upon-Tyne 6. *Engrs' Dig* 1961 Vol 22 (4) pp 133-134 (Apr)

The new model FM, uses a tungsten carbide cutter which is sharpened with a built-in metal-bonded diamond wheel, using jigs to ensure the correct cutting angles. 1 illustr.

A *Az Cfdb Pr:Al Bkcb Chc Nv Urc*

Gear deburring machine

Burrows & Smith Ltd, Leics. *Mach Lloyd* 1961 Vol 33 (7A) p 45 (Apr 8)

The machine carries out the deburring of gear teeth by means of a grinding operation, with a wheel 8 in. in diameter and 1¼ in. wide, formed with a continuous thread, similar to a wormwheel. For deburring helical gears, the workhead is provided with angular adjustment of 30° in either direction. 1 illustr.

L *Ad Chz Pr*

Barrel tumbling using vibrators. Das Gleitschliff-Verfahren unter Anwendung von Vibratoren

G. Bonnemeier. *Industr-Anzeig* 1961 Vol 83 (33) pp 75-84 (Apr) (In German)

Discusses with illustrations, performance data, and diagrams the experiences of several branches of industry using barrel tumbling processes.

A *Chms Pr Qn*

Grinding with cup-wheels

R. R. Cole, Univ of California, Los Angeles. *Machinery, NY* 1961 Vol 67 (7) pp 134-140 (Mar)

Experimental studies of two variations of electrolytic grinding are discussed. In the study of peripheral grinding a metal-bonded diamond wheel was used on sintered carbide, and in the study of grinding with cup-wheels, the wheel used was phosphor bronze with 100 grit diamond at a concentration of 72 ct/cu inch. 4 illustr.

A *Chcr Nvf*

Increasing the effectiveness of honing

N. I. Goraetskii. *Machines and Tooling* 1960 Vol 31 (11) pp 13-15 (Nov) (Original in Russian)

The possible improvements discussed deal with increasing the working area and section of the abrasive stones, and increasing specific pressures through the use of harder stones. 4 illustr.

L *Chh.132*

Paired grinding wheels solve breakdown problem

H. J. Gerber. *Mod Mach Shop* 1961 Vol 33 (10) pp 146-147 (Mar)

In order to produce an accurate diameter on the bearing surface and finish a relief groove adjacent to the shoulder, a single wheel, dressed to the required outline, proved to be impracticable because the thin flange, intended to finish the groove, broke down prematurely on a vitrified wheel. To solve the problem, a shellac bonded wheel was used to form the groove and was held against a thicker wheel. Truing was accomplished by temporarily removing the thin wheel to premit diamond traverse across the wide one. 1 illustr.

E *Ab Cg Nj/Pe Uqe*

Hartex centreless grinding machines

Hartex GmbH, Berlin; Brit Rep: Rockwell Machine Tool Co Ltd, Welsh Harp, Edgware Rd, London NW 2. *Machinery, Lond* 1961 Vol 98 (2522) pp 621-622 (Mar 15)

Discusses two new centreless grinding machines introduced by Hartex GmbH of West Berlin, the BED 4 and BED 5. The larger type BED 5 has a capacity for workpieces from 5/32 to 4¼ in. diameter and up to 10 in. long when set for plunge grinding. Special feature is that both the grinding and control wheel heads can be adjusted independently in relation to the work. A hydraulically operated diamond dresser is mounted over each wheel, and for the grinding wheel either straight or oblique quill motion dressers can be used. Type BED 4 machines are of similar construction but smaller capacity, grinding diameters from 0.04 to 2 in. and plunge grinding workpieces up to 6½ in. long. 1 illustr. *K* *Chcc Pr Psfh:Nj*

Metallographic preparation of sharp edges

P. G. McDougall, N. F. Kennon. *J Aust Inst Metals*, 1960 Vol 5 (3) p 200 (Nov); *Bull Brit non-ferr Met Ass* 1961 Vol 41 (381) p 179 (Apr)

Use of diamond impregnated plastic laps and napless cloths for polishing of very hard metals has been used to secure a sharp straight edge between two polished surfaces. *X* *Bfa Chm Nv*

Problems of automating grinding machines

M. P. Merpert. *Machines and Tooling* 1960 Vol 31 (10) pp 15-19 (Oct) (Original in Russian)

Automation of the grinding cycle with controlled motion, automation of the grinding cycle with measuring—controlling devices which measure the component during the working process, and automation of the grinding cycle with measurement after grinding are considered. As far as accuracy is concerned, the wear of the diamonds used for dressing must be considered too. The small error caused by the wear of the dressing diamonds grows, and after three dressings the diamond must be adjusted. 12 illustr, 14 ref.
L *Chc Prs Psf:Nj*

Micro-honing

Micromatic Honing Corp, Detroit. *Metalworking Prod* 1961 Vol 105 (15) p 9 (Apr 12)

'Fluid-sizing' is a coolant metering method which transmits hydraulic back pressure to an electric control and stops honing of cylinder bores when the required dimension is reached. *W* *Chhc Sj Wp*

Small tools and accessories : Single-bladed reamer

Monks & Crane Ltd, Garretts Green Lane, B'ham 33. *Tooling* 1961 Vol 15 (4) pp 70-71 (Apr)

The Mapal hand reamer consists of a single blade and a precision ground chrome-plated guide body. It is claimed that it reams perfectly round and cylindrical through holes, either singly or with two or more holes in line. The blade can be re-sharpened by simply mounting the reamer body, with the blade in position, on the table of a surface grinder. The blade is then reground on its top surface, making sure that the grinding takes place in a longitudinal direction. 1 illustr. *K* *Ald Chcm Pr/Cel Pd*

Sheet polishing machine makes double work contact

Murray-Way Corp, Birmingham, Mich, USA. *Canad Mach* 1961 Vol 72 (4) p 136 (Apr)

A single endless 60 in. wide abrasive belt makes contact with the workpiece twice in one pass, providing double the surface finishing ability of single-contact machines. 1 illustr.
L *Bfz Chm Pee Pr*

A specialised polishing-lapping machine model 3R140

Il'ich Machine Building Factory, Leningrad. *Machines and Tooling* 1960 Vol 31 (11) p 35 (Nov) (Original in Russian)

The machine is specially designed for the finish lapping of the gears of a car gearbox. A fine-grained lapping wheel with a synthetic rubber bond is used, and a 9th class surface finish and high accuracy are claimed. The lapping process is automatic, and is controlled by a hydrodrive unit. Specifications are given in detail. 1 illustr. *L* *Ad Chd Pr*

Cutter grinding head

A. A. Jones & Shipman Ltd, Narborough Rd South, Leicester. *Mach Lloyd* 1961 Vol 33 (6A) p 45 (Mar)

An automatic cutter grinding head has been developed for mounting on the Jones & Shipman model 540 surface grinder. The equipment uses an 8 in. grinding wheel and is adjustable, so that it can be used for both left and right-hand cutters.

See *Industr Diam Abstr* 1961 Vol 18 p A108 (Apr). 1 illustr. *E* *Alc Chcm Psg*

Investigating the abrasive belt cylindrical grinding process

S. M. Kedrov. *Machines and Tooling* 1960 Vol 31 (10) pp 11-15 (Oct)

The results of an investigation into abrasive belt grinding carried out on centre and centreless grinding machines using coated abrasive belts on a cloth base are given. The factors studied included the effect of abrasive grain size on the metal removal rate and surface finish, the effect of the types of abrasive belt materials, white corundum being compared with standard corundum, and the effect of the steel hardness and other factors on the grinding process. 15 illustr, 4 ref. *L* *Chcl Pee Pr*

Use of radioactive isotopes in choosing grinding cutting fluids

S. N. Korchak. *Machines and Tooling* 1960 Vol 31 (10) pp 27-29 (Oct) (Original in Russian)

An investigation was made, using radioactive isotopes to determine the amount of metal left on the working surface of a grinding wheel using different cutting fluids during a particular grinding procedure. 5 illustr.
L *Chc Qd Syb*

Automation in the construction of apparatus and in the precision industry. Automatisierung im Apparatebau und in der Präzisions-Industrie

F. W. Lohr. *Die Maschine* 1961 Vol 15 (3) p 16 (Mar) (In German)

A new Sallaz automatic rondelling machine is discussed, and attention is drawn to the fact that it is often advisable to submit spindle bearings, requiring high precision, to a rondelling process using sintered carbide or ceramic wheels of varying hardness and grain, finish grinding then being done with diamond grinding wheels of varying grain size.
A *Chcf Prs/Chcw Nv*

Cleaning and finishing

Murray-Way Corp. *Metal Progr* 1961 Vol 79 (2) p 25 (Feb)

An endless abrasive belt, which contacts the work twice in one pass, provides double the surface finishing ability of standard, single-contact flat polishing machines. The abrasive belts up to 60 in. wide may be operated dry or with a moist spray or grease to produce decorative finishes. The oil-resistant neoprene conveyor belt can be driven at speeds varying from 20 ft/min to 60 ft/minute. 1 illustr. *K* *Chm Pee Pr*

Expansible wheel for grinding machines. Ruota espansibile per smerigliatura

D. Mattei, Via Argellati 48, Milan, Italy. *G Officina* 1960 p 11 (Dec) (In Italian); *Europ Tech Dig* 1961 Vol 6 (4) p 82 (Apr)

The wheel, which has internal adjusting devices to prevent deformation of the rubber ring due to peripheral velocity, can be used for cleaning, polishing, trimming, lapping, *etc*, of metal or plastic products, leather, rubber, marble, et cetera. An abrasive cloth is mounted on it, whose size and texture varies according to the work to be performed.

X *Chd Pe Psc/Chm Pe Psc*

Balancing grinding wheels

W. R. Baker, Norton Co, Worcester, Mass USA. *Tool Engr* 1961 Vol 46 (4) pp 51-53 (Mar)

Optimum finish in grinding requires balanced wheels. Causes of wheel unbalance are discussed together with methods for correction and need for periodic rebalancing as the wheel wears. 4 illustr.

X *Pe Qq*

Automatic polishing with fluid grinding and polishing media. Automatisches Polieren mit flüssigen Schleif- und Polierpasten

H. Petter. *Draht* 1961 Vol 12 (3) pp 117-118 (Mar) (In German)

These media are stable, stay homogeneous, do not separate, and can be used for all grinding and polishing tasks. Tests have shown that the use of fluid media has considerable advantages over solid media, and some are mentioned. *A* *Chm Rdc.133*

Grinder sharpens punches and dies

Punch Products Corp, 370 Babcock St, Buffalo 6, NY. *Purchasing Week* 1961 Vol 4 (11) p 38 (Mar 13)

Both standard and special punches and dies of most makes and types can be sharpened with this portable bench-type grinder. The holder positions pieces at an angle of 90° to the grinding wheel and increments on the handle hub permit accurate control of feeding. 1 illustr. *K* *Alm Chc Prw/Ax Chc Prw*

Abrasive engineer's corner : grinding ceramics with iron oxide

A. Rakestraw. *Grinding & Finishing* 1961 Vol 7 (3) p 23 (Mar)

Q : Advise on production grinding of OD of ceramics containing iron oxide. Pieces vary in shape and dimensions, but a ring of 3 in. OD by 2 in. ID is typical. Cylindrical grinders are available.

A : Rings should be surfaced for parallelism on a vertical spindle rotary table surface grinder, with a 36 mesh I grade silicon carbide wheel. The opening should be ground with a metal-bonded diamond wheel on an internal grinder. Periphery should be ground with a vitrified silicon carbide wheel on a cylindrical grinder. *W* *Bl Chc.1456*

Abrasive engineer's corner : wheel loading on soft metals

A. Rakestraw. *Grinding & Finishing* 1961 Vol 7 (3) p 23 (Mar)

Q : How can wheel pick-up on soft wheels be reduced or eliminated.

A : On wet cylindrical or surface grinders the selection of the right coolant is important. Coarse mesh wheels, 24 to 46, in diamond dressed silicon carbide are satisfactory for cylindrical grinding. Stick tallow reduces loading. *W* *Ab Bkcz Cg Nj*

Hartex BED 4 and 5 centreless grinders

Rockwell Machine Tool Co Ltd. *Metalworking Prod* 1961 Vol 105 (14) p 61 (Apr)

Both models are available in two versions, and can carry out both through grinding and plunge grinding. An important feature is that both the grinding and control wheel heads can be independently adjusted relative to the work axis. The grinding wheel has a maximum size of 20 in. diameter by 10 in. wide. A balancing device for the wheel is available. Feed adjustments as fine as 0.00004 in. are allowed.

L *Chcc Pr*

Martin portable electric tools

Scot Urquhart Ltd, 373A Earlsfield Rd, London SW 18. *Machinery, Lond* 1961 Vol 98 (2522) p 618 (Mar 15)

Discusses a grinding and polishing lathe attachment which will take grinding wheels up to 1 in. in diameter and has a spindle speed of 24,000 rev/minute. A portable electric grinder of similar size is available, also a grinder which will take wheels up to ½ in. in diameter, and has a spindle speed of 45,000 rev/minute. 1 illustr.

K *Chc Prd Psc/Chc Prw*

Star profile grinder polishes and grinds irregular shapes

Star Cutter Co, PO Box 376, 34500 Grand River Ave, Farmington, Mich, USA. *Amer Mach* 1961 Vol 105 (6) p 174 (Mar 20)

The No 3 floor-type, tilting table profile machine grinds and polishes contours and irregular shapes, and it is said to be ideally suited for tool and die shops. Complete unit includes two table centre plates, a diamond dresser with diamond nib, two cup wheel arbors, three socket wrenches, seven mounted pencil grinding wheels, and two cup-type grinding wheels. 1 illustr. *E* *Chch Pr Psf:Nj*

Compact grinding attachment handles hard to reach areas

Speedline Sales Co, 12860 Fish Ave, Warren, Mich, USA. *Amer Mach* 1961 Vol 105 (6) p 178 (Mar 20)

Called 'Diamond Speedgrind', this unit is easily attached to most surface grinders. Designed to reach areas inaccessible to conventional machines, the grinder is said to facilitate high precision surface grinding. 1 illustr. *X* *Chcm Psc*

Tap sharpening machine

Trent Engng Co Ltd. *Times Rev Ind* 1961 p 92 (Apr)

The machine uses a 6 in. diameter recessed-type abrasive wheel which is set to suit the required lead angle of the taps. Both right and left-hand taps can be ground, and the amount of relief can be varied.

L *Az Chc Pez Pr*

Automation of plunge grinding operations

G. P. Ushakov. *Machines and Tooling* 1960 Vol 31 (11) pp 12-13 (Nov) (Original in Russian)

A mechanism for automatically controlling the working cycle in plunge grinding operations, has been developed by the Moscow Light Car Factory. The application of the mechanism is described. The grinding wheel is redressed manually to compensate for wear. 2 illustr. *L* *Chcd Psc.133*

REQUESTS FROM AMERICA

American readers who wish to order a photostat or reprint of an article abstracted in Industrial Diamond Abstracts are advised to apply directly to the appropriate journal if this is an American publication.

1961 Engineering & Welding Exhibition : Ancillary equipment

Vacu-Blast, Ltd. *Metalworking Prod* 1961 Vol 105 (17) p 79 (Apr 26)

Among the exhibits was the Vacu-Blast, Ltd new dry honer unit in which fine abrasives down to 600 mesh are fed without the aid of a liquid propellant as necessary for slurry honing.

A *Chh Pr*

BP 841,601 (Mar 5, 1958) **W. H. Bateman**

Method and means for forming the teeth of gear wheels and the like

A toothed pinion of form similar to that to be formed on the workpiece and the workpiece are mounted on parallel shafts. They engage a rotary control worm respectively. The helix of the worm is in alignment with the tooth flanks of the pinion and workpiece and pinion are moved in two directions at right angles to the tool and worm axes and parallel with tool and worm axes. The (grinding) tool consists of parts of different abrasive quality acting successively. Truing is effected by substituting the workpiece by a corresponding truing tool. 8 claims, 3 illustr.

J *Ag Chcf.1456.545*

BP 842,096 (Aug 29, 1956) **D. R. Carlton, Oregon Saw Chain Corp**

Apparatus for sharpening saw chains

Fig 15 and 16 show the arrangement of the chain and the truing device with crushing roller 92. The grinding wheel 55 is designed in contact with scratcher chain 14 for grinding the successive teeth as they move through

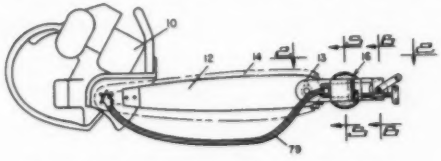
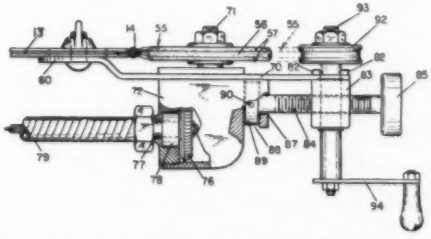


Fig 15 (above) and 16 (below). BP 842,096.



a curved path. Crushing roller and grinding wheel are mounted on the frame attached to saw bar nose 13 of saw bar 12 so that the roller is symmetrical with respect to the median plane of the saw bar 12. 7 claims, 7 illustr.

J *Az Chc Psc.545*

USP 2,942,389 (Aug 29, 1957) **W. S. Praeg, J. J. Sigman, National Broach & Machine Co**

Gear finishing

3 claims, 8 illustr. Ref cited : 5 USP ; 1 BP.

M *Ad Chm.1456.545*

LITERATURE REQUESTS

Please quote the page number of the journal which contains the original reference, and the author and title of the article, in all cases.

BP 842,332 (Mar 26, 1957) **J. V. Ronaldson, R. C. Hollingworth**

Tools for the abrasive treatment of the interior of hollow bodies

A mounting head is introduced into and rotated in the tubular body the head carrying a plurality of abrasive elements which are swung outward by centrifugal force in response to the rotation of the head to contact the interior surface of the body. The elements may be discs or rollers. They may be of boxwood for use with diamond paste, diamond impregnated metal wheels, silicon or tungsten carbide, or aluminium oxide, suitable as reamers for boreholes. 7 claims, 7 illustr.

J *Az Ceq P Rd.545*

USP 2,944,880 (Apr 25, 1957) **L. R. Allen, D. H. Woodard, Kenmore Research Co**

Lapping compound

8 claims, 2 illustr. Ref cited : 6 USP.

M *Chd Rdc.545*

USP 2,945,331 (May 16, 1957) **L. J. La Barre, W. I. Girdner, Hewlett-Packard Co**

Lapping machine

4 claims, 7 illustr. Ref cited : 7 USP.

M *Chd Pr.545*

USP 2,946,162 (May 19, 1958) **S. S. Mader, J. W. Johnson, Norton Co**

Multiple wheel grinding machine

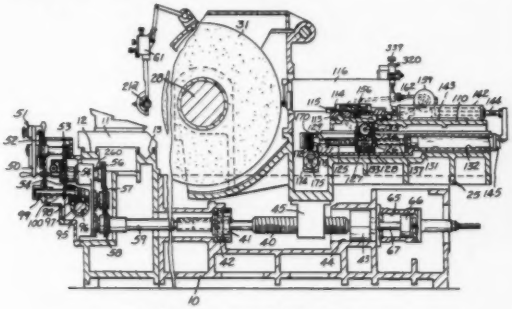


Fig 17. USP 2,946,162.

The machine is equipped with four indentical truing units arranged on a longitudinally movable slide which facilitates setting up the machine and positioning the truing tools to correspond with the spacing of the

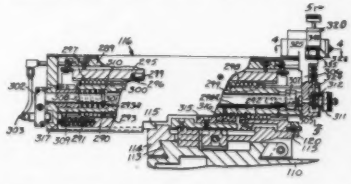


Fig 18. USP 2,946,162.

grinding wheels. Fig 18 illustrates truing unit 116 with tool slide 290 on rows of balls 291, 292. Diamond 303 is arranged on bracket 302 on rod 301. The rod is fed by feed screw 305. 315 is a forming bar engaged by follower 316, 320 is a compensating unit including an hydraulic piston and a ratchet mechanism. Manual adjustment of the feed screw is effected by knob 311. Fig 17 shows the arrangement of truing tool unit 116 in relation to one of the grinding wheels 31. 14 claims, 10 illustr. Ref cited : 2 USP.

J *Chc Pr.545*

Swiss P 346,784 (Sep 25, 1956) **O. Augustin, Swisstool AG**

Method and device for the grinding or lapping of centre holes in workpieces with pre-drilled centering holes. Verfahren und Einrichtung zum Schleifen oder Läppen von Zentren in Werkstücken mit vorgebohrten Zentrierungen

The pre-drilled hole itself is used to guide the grinding or lapping pencil by means of three bearing surfaces in the centering member Fig 19 and 20 show the general arrangement of workpiece 1 between centres 4 and 5

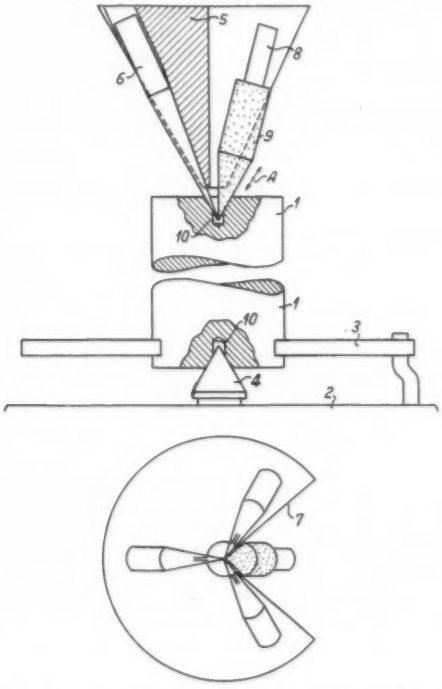


Fig 19 (top) and 20 (bottom). Swiss P 346,784.

the latter carrying three uniformly spaced bearing pins 6. Between two of these pins there is a slot 7 through which the grinding pencil 9 engages the centering hole 10. 9 claims, 4 illustr.

J *Az Chc.545/Az Chd.545*

FP 1,224,972 (Feb 10, 1959) **J. Lissillour, J. Chervet, J. Geffroy, P. Lafforgue, Commissariat à l'Energie Atomique**

Grinding and polishing apparatus for metallography. Planeuse-polisseuse de métallogénie

The metallographic specimen is polished while moved simultaneously in such a way relatively to the grinding plate that each point describes a circle of constant radius and also a translatory movement so that the rotation successively covers each point of the grinding plate. The movements may be combined the plate and specimen both moving in a certain way. Or plate or specimen may be moved while the other part is fixed. This method ensures better distribution of the abrasive (diamond). There is no loss of abrasive by centrifugal force and finishing by hand can be dispensed with. 4 claims, 9 illustr. *J* *Bf Chm Pr.545*

MACHINING PROCESSES AND DEVELOPMENTS

Chipbreaker used in machining/electrolytic grinding. Spanlose Arbeitsmaschinen : Flachbackenwalzverfahren Gewindeherstellung

Anon. *Industrieblatt* 1961 Vol 61 (4) p 262 (Apr) (In German)

The use of special diamond grinding wheels in these processes is discussed and their advantages are considered. 1 illustr.

A *Ceq Nv/Chcr Nv*

Pera to investigate electrolytic machining

Anon. *Pera Bull* 1961 Vol 14 (4) pp 87-90 (Apr)

Electrolytic machining, which should not be confused with electric spark-discharge machining, is described as a process involving the localised and controlled dissolution of the material being machined. Its initial development was concentrated on grinding in an attempt to reduce the consumption of industrial diamonds. Although a diamond wheel is still often used in the process, wheel life, it is claimed, can be extended by about 3 to 10 times. In fact longer diamond wheel life or in some cases the elimination of costly diamond wheels is claimed as the main advantage of the process. The electrolytic machining process is described and there are chapters, on applications equipment, metal removal rate, and research and development at PERA. *E* *Ceqh Nv*

Spark erosion machining equipment. New range introduced to British industry

Anon. *Metallurgia* 1961 Vol 63 (377) pp 137-139 (Mar) 5 illustr, 1 table. *X* *Ceqmb Pr*

Electroshaping : A new way with new metals

Anon. *Mach Lloyd* 1961 Vol 33 (5A) pp 22-23 (Mar 11)

The principles and practice of electrical, chemical, and electrochemical processes for metal removal are discussed, especially with reference to the new, very tough and very hard metal. 2 illustr.

E *Ceqh.21*

Ultrasonics for metalcutting

G. C. Brown, J. N. Behm. *Tool Engr* 1961 Vol 46 (4) pp 57-60 (Mar)

In addition to its use in ultrasonic machining, ultrasonic energy can make conventional turning, milling and grinding operations more efficient. 4 illustr.

X *Bf Ceqr*

An experimental investigation of the electrolytic grinding process

R. R. Cole. *ASME Paper 60-WA-2* 1960 8 pp (Winter) ; *Bull Brit non-ferr Met Ass* 1961 Vol 41 (380) p 135 (Mar)

Using a modified commercial electrolytic grinder, with cup type metal bonded diamond wheel, the effects on grinding rate of pressure, current density, and electrolyte flow and concentration were studied.

X *Chcr Nvf Pr*

Electrolytic drill sharpener : Does not generate heat in drill

Connecticut Special Mach, Winsted, Conn, USA. *Canad Mach* 1961 Vol 72 (4) p 142 (Apr)

The Ampak electrolytic drill sharpener is designed for HSS twist drills, and does not generate the heat of conventional methods, in spite of the very fast sharpening rate. 1 illustr.

L *Alhz Bfchd Chcr Pr*

Spark erosion grinding of sintered carbide tools

P. Kips. *Industr-Anzeig* 1961 Vol 83 (27) pp 439-446 (Apr 4) (In German)

Discusses tests carried out using spark erosion grinding and grinding with diamond wheels, and compares the results. It has been found that profiles can be produced on sintered carbide by spark erosion, a diamond being used to trace the profile on the electrode. It was also found that spark erosion requires a longer grinding time than diamond grinding, and costs are higher. Difficult grinding tasks are more easily done by spark erosion, however. 22 illustr, 14 ref, 5 tables.

A *Al Bkc Ceqmb* Al Bkc Chc Nv*

Ultrasonics ups grinding efficiency

J. Peacock. *Amer Mach* 1961 Vol 105 (6) pp 124-125 (Mar 20)

Ultrasonic vibrations introduced in the coolant on surface and cylindrical grinders, produce effects that, it is claimed, prevent loading, lengthen wheel life and improve finish. Significant reduction in wheel dressing are quoted. 5 illustr. *E* *Chc Sj:Qnf*

The electrolytic working of sintered carbide. Die elektrolytische Bearbeitung von Hartmetall

K. E. Schwarz. *Maschine* 1961 Vol 15 (4) p 63 (Apr) (In German)

It discusses the Eleform method of electrolytic grinding, in which a plate containing diamond particles in a conductive, highly porous bond, is connected with the cathode. This method is claimed to remove ten to twenty times as much material as the normal diamond grinding wheel. 1 illustr.

A *Bkc Chcr Km*

Sheffield unit-construction ultrasonic machining equipment

Sheffield Corp, Dayton, Ohio. Brit Rep : Catmur Machine Tool Corp Ltd, 103 Lancaster Rd, London W 11. *Machinery, Lond* 1961 Vol 98 (2522) pp 619-620 (Mar 15) 1 illustr. *K* *Ceqr Pr*

Practical and economic problems of machining cavities by spark-erosion

W. Ullmann, T. G. Traube. *Met Treatment* 1960 Vol 27 pp 493-501 (Dec) ; *Bull Brit non-ferr Met Ass* 1961 Vol 41 (380) (Mar)

The requirements of adequate erosion rates, low electrode wear, variation of spark gap, flushing conditions rigidity and precision of the machine tool in the machining of moulds and dies by spark-erosion are considered. *X* *Ceqmb.21*

Effects of ultrasonic vibrations in machining creep resistant alloys

A. A. Voronin, A. I. Markov. *Machines and Tooling* 1960 Vol 31 (11) pp 15-18 (Nov) (Original in Russian)

The effect of ultrasonic vibrations on surface finish, conditions of the surface layer, and the wear of the grinding wheel in surface grinding, were studied. In turning, the effect of ultrasonic vibrations on cutter life, the deformation of the chip, and surface finish were observed. 8 illustr, 5 ref.

L *Ceq Qnf Unf/Ceq Qnf Uqc*

DIAMOND TECHNOLOGY

First published 1942 as " Production Methods for Diamond and Gemstone." The second edition of this book by P. Grodzinski has been revised throughout and considerably enlarged. 840 pages, 486 illustrations, 94 tables, and indexes. From NAG Press Ltd., 226 Latymer Court, London W 6. 55s, post free.

Electrolytic machining ; a review of progress and application

L. A. Williams. *Aircraft Prod* 1960 Vol 22 (10) pp 389-394 (Oct) ; *Bull Brit non-ferr Met Ass* 1961 Vol 41 (380) p 134 (Mar)

Electrolytic machining is classified into five aspects : singe-point carbide-tool grinding ; sharpening carbide-tipped milling-cutters ; production of parts from tough, stringy or temperature-sensitive materials ; grinding HSS tools ; and cavity-sinking. Equipment, problems, specific applications, costs. *X* *Ceqh.21*

USP 2,944,172 **W. Opitz, H. Spruck, K. H. Steigerwald,** (Aug 30, 1958—conv date, Germany) **Carl Zeiss**

Apparatus for working materials by means of a beam of charged particles

16 claims, 7 illustr.

M *B Ceqj Pr.545*

USP 2,945,936 **E. H. Carman, Birmingham Small Arms Co Ltd**

(Mar 2, 1956—conv date, Gt Britain)

Spark-machining

A deep cylindrical plain hole is produced by using a hollow electrode having integrally formed spiral flutes which is together with the workpiece continuously rotated while a flow of dielectric fluid is maintained through the hollow electrode. The rate of feed of the electrode is to be such that the correct spark gap is always kept between the end of the electrode and the workpiece. The helical electrode causes debris to be screwed out of the hole permitting faster cutting. The distribution of the sparking round the periphery of the hole results in cleaner and more truly cylindrical holes. 3 claims, 5 illustr. Ref cited : 8 USP ; 2 BP.

J *Ceqm Ptc.545*

Swiss P 346,953 (Oct 1, 1958) **J. Pfau, Ateliers des Charmilles SA**

Method of electric machining. Procédé d'usinage électrique

The characteristic feature of this method is the use of a suspension of solid electrically conductive particles of a size smaller than the gap between the electrode and the workpiece into which this suspension is directed. Fig 21 illustrates an apparatus with a rotating disc 10 as electrode, the workpiece 6 and the nozzle 15 to direct

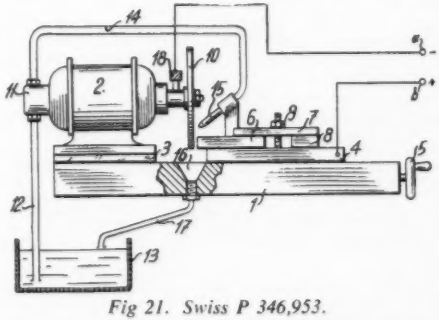


Fig 21. Swiss P 346,953.

the suspension into the gap. The particles of a size of 0.2 to 20 μ may be carbon, metal or metal oxides, a metal salt. The liquid in which these particles are suspended may be an oil, an aqueous saline solution, a polyvalent alcohol, a mixture of glycerin and water and carbon particles and it may contain a foaming agent. 19 claims, 2 illustr.

J *Ceqm.1456.545*

USP 2,946,731 (Nov 13, 1956) **J. J. Falls, Standard Electrical Tool Co**

Method and apparatus for electrolytic shaping

The electrolytic grinding process operates with an electrically charged wheel having a non-conductive abrasive layer opposite the electrically charged workpiece. The gap between the metal of the wheel and the metal of the workpiece is bridged by the electrolytic fluid and it is important that workpiece and wheel are kept properly charged without possible damage to driving spindle, bearings, housing and other parts of the mechanism. The problem has been solved by the arrangement of a special conductive rod inside but insulated from a hollow driving spindle the current being directed through the rod directly to the wheel. The electrolytic fluid is applied to the wheel facing by a jet the layer of dielectric, abrasive, particles entraining and distributing the electrolyte upon the workpiece. 17 claims, 6 illustr. Ref cited : 8 USP ; *Amer Mach* 1953 ; *Steel* 1952.

J *Ceqh.1456.545*

Swiss P 347,129 **M. Heerschap, C. M. Levitt, Industrial Distributors (1946) Ltd**

(Mar 20, 1957 ; Apr 5, 1957—conv date, South Africa)

Method for eroding a diamond and device for carrying out this method. Procédé pour éroder un diamant et dispositif pour se mise en oeuvre

See USP 2,939,941. 19 claims, 9 illustr.

See *Industr Diam Abstr* 1961 Vol 18 p A139 (May).

J *F Hp.545*

PRODUCTION, GRADING & RECOVERY OF ABRASIVE PARTICLES

New compounds for barrel-tumbling. A new vibrator. Neue Schleifkörper für das Gleitschliffverfahren. Ein neuer Vibrator

Anon. *Draht* 1961 Vol 12 (3) p 122 (Mar) (In German)

The Roto-Finish compounds A, KF, and GK are designed for different tasks and materials. The Roto-Finish Vibrator RV200 can be tilted to 105°, and is designed for iron, steel, and non-ferrous metals.

A *Chm Qn:Pr/Chmz Rdc*

Diamond grit. Specially for metal-bonded tools

Anon. *Canad Mach* 1961 Vol 72 (3) p 93 (Mar)

See *Industr Diam Abstr* 1961 Vol 18 p A35 (Feb).

E *Kl Nq Urc*

Which diamond particle shape should you use ?

Anon. *Grinding & Finishing* 1961 Vol 7 (3) pp 42-43 (Mar)

Six types of diamond abrasive for grinding wheels are listed. They are briefly considered in terms of wheel life and suitability for various operations. The six types are : *RVG*—Synthetic diamonds for resinoid and vitrified wheels ; *MBG*—Synthetic diamonds for metal bonds ; *Market Grade*—Natural diamond processed by conventional crushing methods ; *SND-MB*—Selected natural blocky particles ; *SND*—Selected natural slivers and flats, sometimes treated to improve fribility ; *Pressure-Tested*—Natural or synthetic diamond crushed to uniform blockey shapes. 4 illustr.

W *Ft.21/Km.21/Kmg.21*

Pushbutton mixmaster speeds grinding-wheel production

Bay State Abrasive Prod Co. *Amer Mach* 1961 Vol 105 (5) p 143 (Mar 6)

A punched-card controlled apparatus for automatically measuring and mixing grinding wheel ingredients is reported to be accurate within one-millionth of a pound. The required formula is punched on to the card and this governs, through electronic impulses, the operation of abrasive storage bins.

W *Pe Qc Wb*

What you should know about grain sizes

R. L. McKee. *Grinding & Finishing* 1961 Vol 7 (3) pp 38-40 (Mar)

Discusses the importance of selecting the correct mesh size for a grinding operation and explains the American wheel marking system. Diamond dressing can reduce the importance of grain size, and by careful dressing it is possible to produce a 46 mesh wheel giving as good a finish as one of 120 mesh. 2 illustr, 1 table.

W *Cg Nj Uub/Uub.18*

Carborundum

M. Schofield. *Min Mag, Lond* 1961 Vol 104 (4) pp 218-219 (Apr)

Reviews fifty years' development by Carborundum of abrasives, such as silicon carbide and corundum, and finally the production of diamond abrasives.

E *Km.132/Rd.132*

A new way of testing loose abrasives. Ein neuer Weg zur Prüfung von losem Schleifkorn

H. Stotko. *Z Ver Dtsch Ing* Vol 103 (12) p 546 (Apr) (In German)

The method and instrument employed can also be used to study diamond particles, and to give satisfactory results for both natural and synthetic diamond.

A *Km Vw W/Kmf Vw W*

BP 841,684 (May 24, 1956) **D. S. Hobbs, Mullard Radio Valve Co Ltd**

Improvements in and relating to particle counting apparatus

6 claims, 2 illustr. *M* *Vgf W.545*

USP 2,943,926 (July 18, 1958) **G. J. Goepfert, Cincinnati Milling Machine Co**

Abrasive wheel composition

This refers to the manufacture of high-bond, low porosity grinding wheels, *ie* with a high ratio of resin bond to abrasive (alumina, silicon carbide, diamond, zirconia, garnet or emery of between 8 and 60 grit). Distinct portions of resin powder or a mixture of such powder with a filler are applied to the surfaces of the abrasive grain after this has first been wetted with a small quantity of a liquid adhesion-promoting agent (liquid form of the solid coating resin, or an organic solvent for the resin or a mixture of solvent and resin). The thinly coated grain is then mixed with water and a second portion powdered resin added. Water is then removed by heating. The coated granules may be stored a long time under a dusting powder if desired until used for moulding into wheels. 11 claims, no illustr. Ref cited : 3 USP.

J *Ab Cs Urb.1456.545*

DAS 1,084,705 (July 19, 1957) **I. Csordas, B. Lanyi, Z. Veres, L. Visy, Kábel-és Müanyaggár**

Producing finely granular corundum especially adapted for metal-ceramic purposes. Verfahren zur Herstellung von feinkörnigem Korund, der sich besonders für metallkeramische Zwecke eignet

1 claim. Ref cited : 1 USP, 1 book.

M *Qt Rjc.545*

FP 1,226,323 (June 5, 1959) **M. Ferrand**

Method of manufacturing abrasive surfaces by electro-deposition and product thus obtained. Procédé de fabrication de surfaces abrasives par électro formage et produit obtenu

The characteristic feature of the method is the use of a brass foil on an insulating support in an electrolytic bath. Abrasive grains *eg* diamonds and bonding metal are deposited on the foil forming the cathode which may be of plain shape or profiled. The abrasive metal foil can thus be attached to a tool simply by heating to the comparatively low fusion temperature of the brass. 5 claims, 5 illustr. *J* *Pd Qmz.545*

TOOL PRODUCTION

Precision turning of steel. Feindrehen von Stahl

Anon. *Fertigungstechnik, Berl* 1961 Vol 11 (4) p 260 (Apr) (In German)

The best grinding form of the carbide tool tip is discussed. 1 illustr.

A *Bfcb Ceqbb Pdc*

Tool and cutter grinders. Stähle- und Spanleitstufen-Schleifmaschinen

Anon. *Industriekurier* 1961 Vol 63 (14) p 232 (Apr) (In German)

Diamond and ceramic grinding wheels are used to grind and lap turning tools made of HSS and sintered carbide. 1 illustr.

A *Al Chc Nv/Al Chc Pe Rp*

Broaching with cemented [sintered] carbides

Prof C. Edgar, Univ of Delaware, USA. *Machinery, NY* 1961 Vol 67 (6) pp 109-115 (Feb)

For some broach applications, as many as 1,400 or 1,500 individual carbide teeth are employed. As each tooth is preferably diamond-ground, and as grinding hard carbides with diamond wheels is costly, the less grinding per tooth the better. The preferred method is to use a 100-grit, phenolic-bond diamond wheel for roughing, and a 220 or finishing. Silicon carbide is sometimes used, but for broaches it is not very satisfactory except for hogging off superfluous stock. 6 illustr. *E* *Ale Bkc Chc Nv/Cfm Pdc*

Want to prevent tool failure ? Here's how !

A. P. Goeppert. *Cutting Tool Eng* 1961 Vol 1 (1) pp 3-7 (Jan)

Faulty grinding is the cause of a large proportion of tool failure. Every carbide tool should be honed on a 95° angle which will even up the cutting edge, so that it presents a straight line to the work, giving a much stronger tool, and resulting in longer tool life.

K *Al Bk Chh Uqc*

Improved design of parting-off tools

V. M. Kanevtsov. *Machines and Tooling* 1960 Vol 31 (10) pp 24-25 (Oct) (Original in Russian)

The most intensive wear usually arises on the side faces of the tip of the tool, and a new tool designed by the Bearing Industry Experimental Institute eliminates this fault by having the side surfaces of the cutting edges represent part of the surface of a circular or elliptical cylinder, the axis of which is inclined to the base of the tool. To achieve this the side surfaces of the parting-off tools are ground with a cup grinding wheel. 2 illustr. *L* *Alz Chc Pez*

Experiences with a 'central grinding pool' for turning tools. Erfahrungen mit einer 'Zentralen Schleifecke' für Drehstähle

H. Lossman & K. Plonka. *Feingerätetechnik* 1961 (3) p 140 (Mar) (In German)

A discussion of three years' experience of this installation in the VEB Carl Zeiss, Jena, including a description of the three types of grinder used; one for sintered carbide tipped tools; a surface grinder, incorporating a VEB Carl Zeiss diamond grinding wheel; and a grinder for chip production.

A *Al Bkc Chc Pr/Al Chcm Nv Pr*

BP 841,779 **M. -L. Klein**

(Oct 4, 1956 ; Aug 16, 1957 ; Sep 25, 1957—conv date, Switzerland)

Small-sized drill and method for producing same

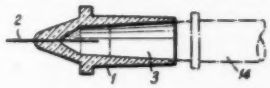


Fig 22. BP 841,779.

A mouldable material melting at a low temperature (nylon, tin, or lead) is cast over a very thin wire to form a socket from which the wire projects. Fig 23 is an axial sectional view of a suitable moulding arrangement. Wire 2 is clamped in the pincers 18 and set inside

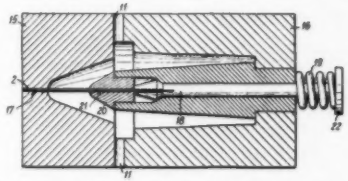


Fig 23. BP 841,779.

shell member 16. Block 20 is then fitted in position and the shell closed by shell member 15. The moulding material is injected through pipe 11 and the moulded socket of a shape illustraated in Fig 22 ejected by pressure on knob 22. 8 claims, 7 illustr.

J *Pl Qc.545*

MISCELLANEOUS

The diamond in myth and history

Anon. *New Scientist* 1961 Vol 9 (226) p 663 (Mar 16)

S. Tolansky gave a lecture on diamonds, outlining their general history, cutting and polishing, and miraculous powers attributed to the gems.

L *F.28*

Diamonds in the swarf

Abstr from 'Grits & Grinds', Norton Co, Worcs 6, Mass, USA. *Machinery, NY* 1961 Vol 67 (6) p 97 (Feb)

When grinding carbide with diamond wheels, it is advisable to save up the tank sludge, and when 50 lbs (dry) or more has been collected, the sludge should be sent away for reclamation. Swarf from the coolant reservoir only should be saved. A 5 lb sample may be sent to the grinding wheel manufacturer to see if the swarf is worth re-claiming. *L* *Fw Hw*

REQUESTS FROM AMERICA

American readers who wish to order a photostat or reprint of an article abstracted in Industrial Diamond Abstracts are advised to apply directly to the appropriate journal if this is an American publication.

Space gems ?

D. V. N. Sarma, T. Mayeda. *Geochimica et Cosmochimica Acta* Vol 22 p 169 ; *New Scientist* 1961 Vol 10 (230) p 50 (Apr)

A new technique has been discovered for opening up the most refractory meteorite minerals such as spinels, using potassium hydrogen fluoride fusion, to find out if the meteorites contain diamonds, which were first detected in meteorites in 1888.

L *Eg F Hkb.1456*

USP 2,942,849 (June 2, 1958) **A. G. Bodine**

Method for sonic earth boring by sonic use of resonant wave pattern transmitted from ground surface

1 claim, 3 illustr. Ref cited : 2 USP.

M *Az Bnt Cfb.1456.545*

PUBLICATIONS RECEIVED

BOOK REVIEWS

Chip-producing machine tools. Die Beschaffung von Werkzeugmaschinen der spanabhebenden Fertigung

F. Frey. Carl Hanser Verlag, Munich. 1961. 228 pages, illustr

This book provides an introduction to the problem of supplying and selecting machine tools for small and medium-sized workshops. The book is divided into three main sections, the first dealing with the basic problems involved, the evaluating of requirements, replacement of old machines and the choice of machine types, including chapters on general, business and legal aspects. The second section gives a comprehensive survey of the various elements. The third section discusses in detail the various kinds of machine tools, including bores, milling machines and grinders.

K *Ceq Pr.52*

TRADE LITERATURE

Dumore precision grinding tools. [Catalogue 60-FL]

Dumore Precision Tools, The Dumore Co, Racine, Wisconsin. 35 pp, 8½ × 11 in., illustr

Comprehensive catalogue of small grinding tools and accessories, including tool post grinders, drills, hand grinders, flexible shaft tools, micro drill, and drill grinder.

The larger tool post grinders are supplied with diamond truing tools, and special diamond wheel grills are available. The latter are provided with grease-sealed bearings and are protected from the entry of diamond dust by NILOS Rings.

Two diamond truing tools—2 1/16 or 4⅛ in. span—are available, and can be clamped on workpiece or piece of material chucked in lathe.

W *Chc Nv Psz:Pr.57|Chc Pr Psf:Nj.57*

Industrial diamonds, diamond tools, diamond indenters, diamond grinding wheels and files

Fiudi Fabbrica Italiana Utensili Diamanti Industriali Piazza Cesare Augusto 1, Turin, Italy. 2 pp, 9 5/16 × 6 9/16 in., illustr. (In Italian)

Lists the various uses of the tools.

M *N.57*

Industrial diamond and diamond tools

Fiudi Fabbrica Italiana Utensili Diamanti Industriali Piazza Cesare Augusto 1, Turin, Italy. 22 pp, 9 × 6⅛ in., illustr. (In Italian)

This gives a short survey of the use and application of diamond tools, especially for grinding. It stresses the importance of choosing the correct diamonds for the work. It lists truing tools, profiling tools, turning, lapping, and milling tools, and hardness testing indenters.

M *N.57*

Oil-dynamically controlled production grinder Model R9. Rettificatrice di produzione Tipo R9

Giuseppe Rastelli, Via Altamura 4, Milan, Italy. 6 pp, 11⅜ × 7⅛ in., illustr. (In Italian)

Machine accessories include an internal hydraulic truing device which also controls the measurement of the grinding wheel.

M *Chc Pr Psfb*

Söderfors Rekord sintered carbide tools. Söderfors Rekord metallo duro

Söderfors, Milan, Italy. 14 pp, 8¼ × 5¾ in. (In Italian)

Söderfors tools conform to ISO standards. Their application, quality and shapes are listed as well as their production programme.

M *Pdc*

The SS White industrial abrasive unit : Bulletin 6006

S. S. White Industrial Div, 10E 40th St, New York 16, NY. 15 pp, 11 × 8½ in., illustr

The Abrasive Unit slices and abrades hard and brittle materials by means of a gas-propelled jet of fine abrasive, directed onto the workpiece through a nozzle. A nozzle with an orifice 0.006 × 0.060 in. will produce a cut down to 0.008 in. wide, and special nozzles can reduce this width. The unit can be employed free-hand or mounted, and typical operations which can be performed include cutting of silicon wafers, hole drilling, deburning, abrasion testing, ceramics cleaning, engraving, and wire stripping.

Five types of abrasive are supplied ; aluminium oxide in three micron sizes, dolomite for light cleaning, and especially processed sodium bicarbonate for potentiometer manufactures. Abrasives which are non-toxic, cannot be re-used.

W *Ceqz Pr Rdb*

The craelius instrument for drill hole survey

Svenska Diamantbergborrnings AB, Stockholm, Sweden. 4 pp, 8½ × 11¼ in., illustr

The electromagnetic indicator measures the angle of inclination and direction of diamond drill bore holes down to 1000 m (3,000 feet).

It can be used to bore holes of 36 mm diameter (equivalent to EX) and, by using guide cages, for bore holes of greater diameter.

It is unaffected by magnetic influence, and can thus be used in magnetic and other ores as well as in casing.

All angles of inclination and directions from the vertical up to five degrees from the horizontal can be measured by the standard instrument, regardless of whether the bore hole is in an upwards or downwards direction.

By a simple adaption the instrument can be used also to determine the deviation from the horizontal, and when this exceeds five degrees the deviation in direction can also be determined.

W *Az Cfb Nh Wb*

LITERATURE REQUESTS

Please quote the page number of the journal which contains the original reference, and the author and title of the article, in all cases.

Rupert surface roughness indicator

Rupert & Co Ltd. 4 pp, 7¼ × 9½ in., illustr

The instrument uses the friction between the test surface and a sensing wheel as a means of assessing the surface roughness of a testpiece. The friction causes the wheel to rotate until the tension on a tensioning spring balances the frictional drag and the wheel ceases to rotate. The meter reading thus produced fixes an accuracy better than comparison scales over the range 2 to 125 micro-in. CLA. The instrument can also be used for detecting surface flaws and damage, independent of surface finish. *W Wgf*

'Rock' grinders for sintered carbide tipped tools. Affilatrici Rock per uttensili con placchetta di metallo duro

Agierex Italiana SpA. Via Piatti 9, Milan, Italy. 2 pp, 11⅞ × 8¼ in., illustr

Five types of grinders are discussed, and amongst accessories are diamond grinding wheels for free grinding, and diamond grinding wheels combining face grinding and chip breaker grinding.

M Al Bkc Chc Nv Pr

Automatic piston grinder RPS. Rettificatrice automatica per pistoni

Gaetano Zocca, Como, Italy. 6 pp, 12 × 8¼ in., illustr

It is claimed that this machine solves the problem of perfect roundness of the piston. It is completely automatic, and can grind in a few minutes pistons of various forms, *ie* round, oval, conical, elliptical.

M Agg Chc Prs

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868,220 ELLIOTT & CO LTD, B. Surface grinders.

868,526 MICROMATIC HONE CORPORATION. Abrasive element.

868,175 MINE SAFETY APPLIANCES CO. Rock drill construction.

The Official Journal (Patents) 1961 (3764) (Apr 6)

868,684 ROLLS-ROYCE LTD. Drilling by electro-erosion.

868,666 FOUQUET, E. Method of and apparatus for the manufacture of helicoidal grindstones and grindstones obtained by this method.

868,984 GESELLSCHAFT DER L. VON ROLL'-SCHEN EISENWERKE AG. Devices for grinding substantially flat work-pieces, for example the slideways of machine tools.

The Official Journal (Patents) 1961 (3765) (Apr 12)

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869,305 SCRIVENER LTD, ARTHUR, and ADAMS, AE. Feed mechanism for grinding machines.

869,178 TELEFUNKEN GmbH. Apparatus for use in grinding piezo-electric crystals.

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869,934 PHILCO CORPORATION. Semi-conductor units and methods of making them.

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870,588 RUSSELL (SHEARS) LTD. Grinding, polishing, abrading or the like wheel.

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UNITED STATES

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2,973,605 J. N. CARMAN, L. C. DE MILD jun, CARMAN LABORATORIES INC. Lapping machine.

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2,973,950 R. TUCKER, ROBERT G. EVANS CO. Concrete sawing machine having stabilizing wheels.

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2,974,778 W. C. ELLIS, E. S. GREINER, BELL TELEPHONE LABORATORIES INC. Low temperature drawing of metal wires.

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2,975,567 H. B. LITTLE. Method for polishing the balance pivots of a watch.

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60/884 S. Z. LEWIN, EVANS RES & DEVELOPMENT CORP. Method and apparatus for use in determining particle size and distribution of particle sizes.

60/4664 T. H. SLOAN. Apparatus for honing cylindrical bodies.

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AUSTRALIAN

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232,381 MINNESOTA MINING & MFG CO. Abrasive disk.

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351,926 J. DIONESOTTI. *Drilling tool.*

352,067 W. EHRLICH, W. ULLMANN, AG FÜR INDUSTRIELLE ELEKTRONIK AGIE. Device for electroerosive grinding.

352,216 H. SCHICHT, W. FERD KLINGELNBERG SOHNE. Gear wheel lapping machine.

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352,612 G. BARBOTTE. Device for positioning jewels on their holder rods for the drilling and machining operation and method of utilising this device.

352,922 P. L. GLOCKER. Method of preventing tools and workpiece carriers from touching each other and device arranged on a machine tool for carrying out the method.

352,946 I. SCHLUCHTER, M. -L. SPIRA-KLEIN. Machine for drilling hard materials, in particular hard metals and industrial stones for dies and for horology.

FRENCH

Bulletin Officiel 1961 Vol 2 (11-13) (Mar)

1,257,535 S. L. SEYMOUR, PITTSBURGH PLATE GLASS CO. Method and apparatus for cutting glass.

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GERMAN

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1,103,481 W. ULLMANN, W. EHRLICH, AGIE, AG FUR INDUSTRIELLE ELEKTRONIK. Rotary electro-erosive profiling electrode with several partial electrodes.

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1,103,622 A. KOHAUT. Method for testing surface quality by optical means.

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1,103,726 E. WILDHABER, N. W. FOWLER, GLEASON WORKS. Gear producing machine or the like in which the workpiece or the tool spindle or both spindles are carried each by a shiftable turntable.

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INDUSTRIAL DIAMOND INFORMATION BUREAU

Industrial Distributors (Sales) Ltd, 2 Charterhouse Street, London, EC 1.

LIST OF PUBLICATIONS, JUNE, 1961

For information on industrial diamonds contact the Industrial Diamond Information Bureau. Backed by the Diamond Research Laboratory in Johannesburg (the largest laboratory in the world devoted to diamond technology), the Bureau offers information and advice without obligation. Please write to the above address.

***INDUSTRIAL DIAMOND ABSTRACTS:** issued monthly, from 1944 onwards, about 20 pp, 7⅞ x 9¾ in. Surveys technical, scientific, and patent literature.

***LIST OF PERIODICALS IN THE INDUSTRIAL DIAMOND INFORMATION BUREAU LIBRARY AT MAY 31, 1958:** Alphabetical, 8 pp, 7⅞ x 9¼ in. A list of periodicals available for loan from the Industrial Diamond Information Bureau Library. This does not replace *List of Periodicals* (above), which is a list of periodicals abstracted in *Industrial Diamond Abstracts*, many of which are not held by the library.

***IDR REPRINT SERVICE :** Classified, authors' index, subject index of groups, 12 pp, 7⅞ x 9¾ in., Sep 1958. (Reprints 1s each, post free).

***THE DIAMOND RESEARCH LABORATORY:** 16 pp, illustr, 11 x 9 in. Rev ed, 1956.

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IA: Machining metals and non-metallic substances, by P. Grodzinski, W. Jacobsohn. 2nd rev ed, 55 pp, 7⅞ x 9¾ in. Apr 1949. Price 10s.

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III, IIIs: Truing of grinding wheels, by W. Jacobsohn. 133 pp, 82 illustr, name index, 7⅞ x 9¾ in. Dec 1948/49. Price £1.

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* *Publication free of charge.*

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The list of journals (latest issue, September 1955) from which *Industrial Diamond Abstracts* is compiled will be supplied on request.

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The Bureau has a Reference Library which seeks to cover world literature on the application and production of diamond tools. It is kept up to date by a careful examination of new publications announced in abstract and technical journals, and covers, in addition to English, German, French and Russian books. The library specializes in technical and scientific pamphlets.

Patent Abstracts

Patent lists are prepared from official patent journals of the major industrial countries, and patent abstracts in general from the printed patent specifications. Printed copies of British patent specifications accepted may be obtained from the Patent Office, Southampton Buildings, London WC 2, at 3s 6d each. Numbers given under British applications for patents are for reference in all correspondence up to acceptance of the complete specification.

The following abbreviations are used :—BP for British Patent, USP for United States Patent, DAS for German Patent Application, DBP for German Patent (GP for German Patents issued prior to 1950), FP for French Patent, Canad P for Canadian Patent, and RP for Russian Patent.

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The Bureau offers the resources of its considerable literature holdings to those seeking specific information on diamond tool and similar applications. Problems requiring fuller technical assistance can be referred to the Diamond Research Laboratory, Johannesburg.

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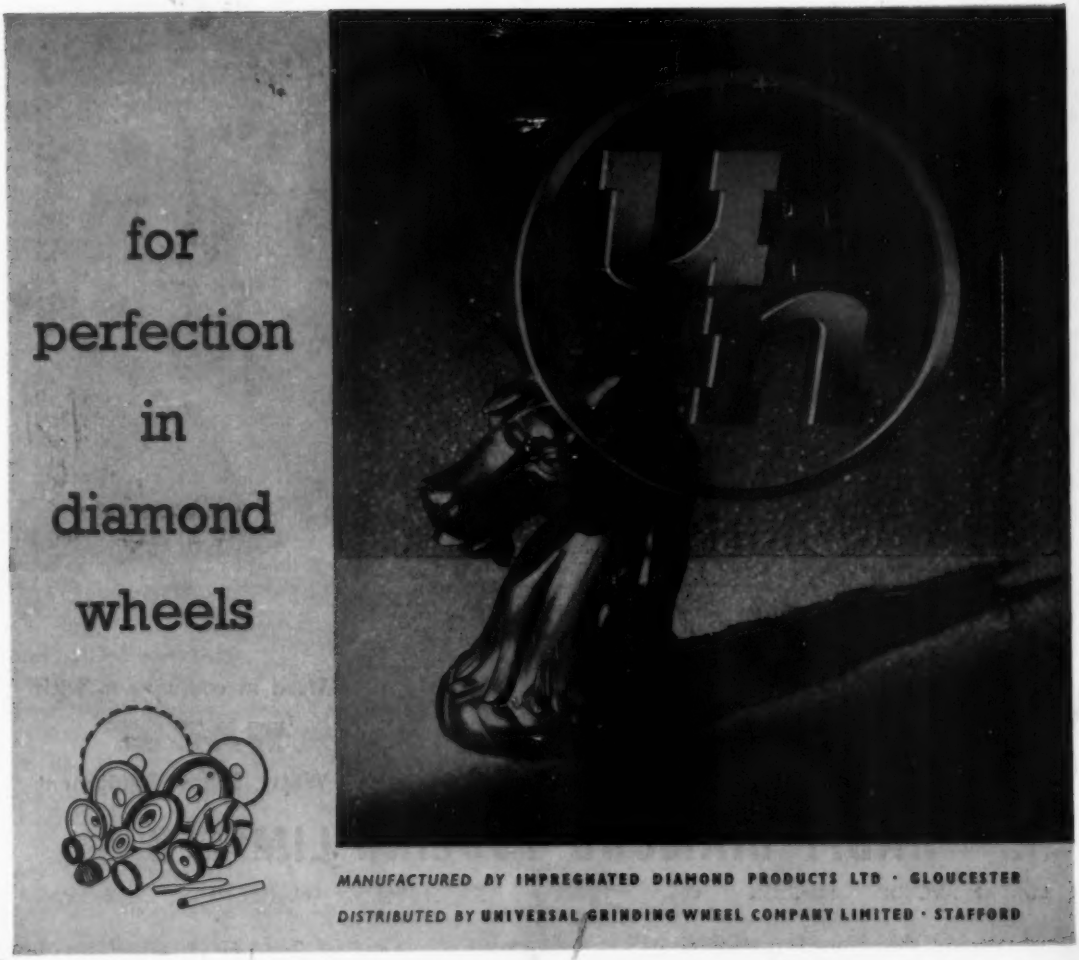
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